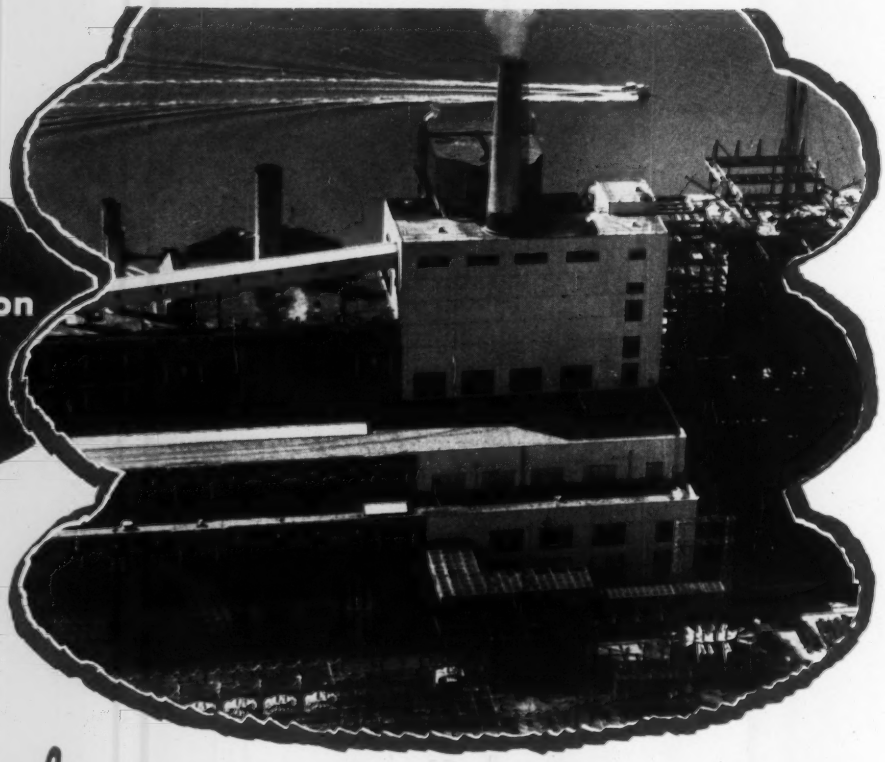
ENGINEERING NEWS-RECORD

A visit with a master: O. H. Ammann p. 136

A McGRAW-HILL PUBLICATION

INGALLS:
Specialists in Steel Fabrication For Every Structural Purpose



Electrifying GROWTH...

With tremendous population and industry increases challenging the capabilities of the electric power industry, plant expansion is a continuing process.

In 1954 Ingalls furnished 2200 tons of fabricated structural steel and 200 tons of platework for an extension to Jersey Central Power & Light Company's Sayreville Station at Sayreville, New Jersey. Now Ingalls is furnishing another 2200 tons for the '58 extension of this plant. Both extensions were designed by Burns and Roe, Inc., who also supervised construction.

Jersey Central Power and Light Company is one of 46 leading power companies who selected Ingalls to furnish and erect the fabricated steel for their recent extensions.

If your plans call for the strength and economy of fabricated steel, call on Ingalls—specialists in structural steel fabrication and erection for over 48 years.

STEEL PLATE FABRICATORS ASSOCIATION — FOUNDED 1933

AISC — AMERICAN INSTITUTE OF STEEL CONSTRUCTION INC. — FOUNDED 1921

THE
INGALLS
INDUSTRIES
Executive Offices
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INGALLS INDUSTRIES ARE:

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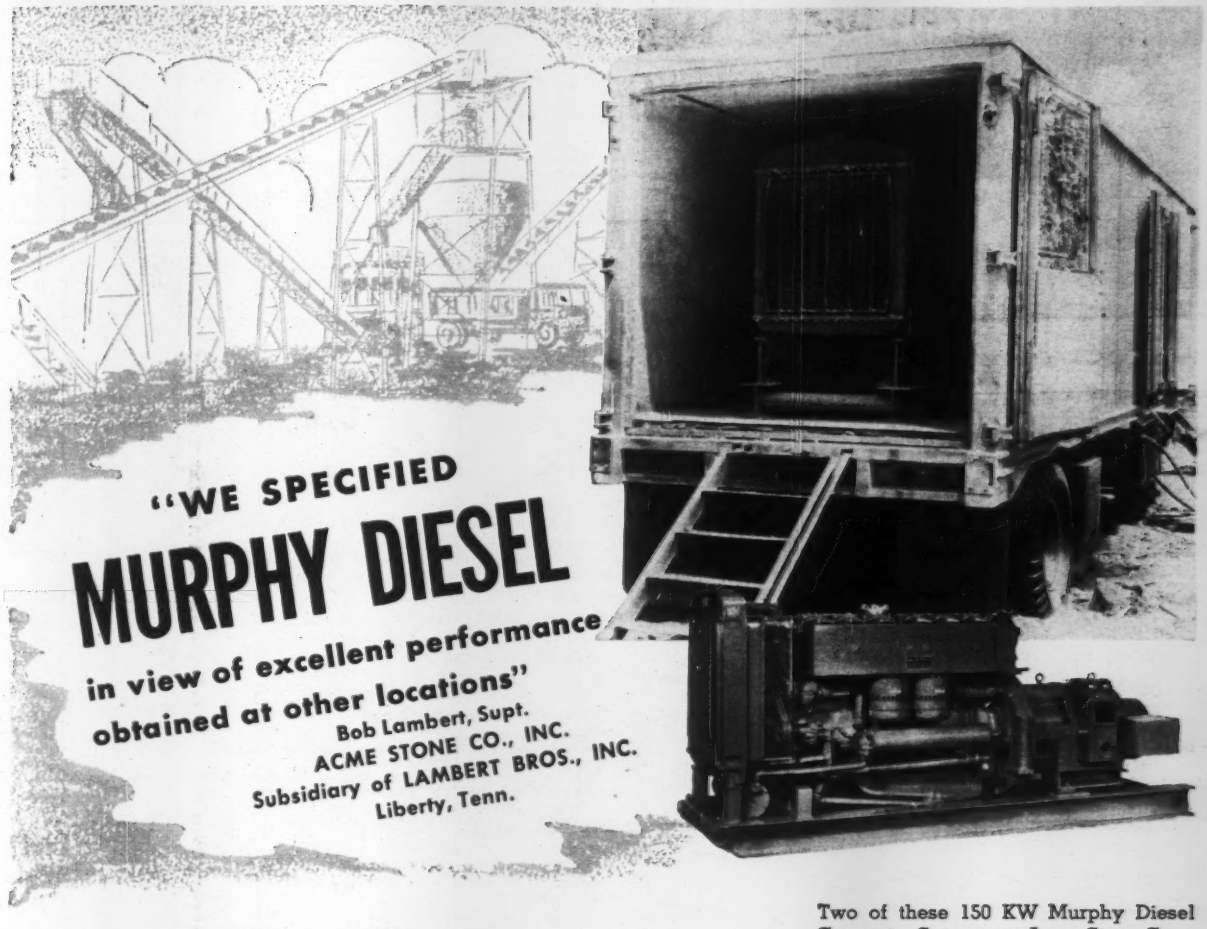

"WE SPECIFIED

MURPHY DIESEL

in view of excellent performance obtained at other locations"

Bob Lambert, Supt.
ACME STONE CO., INC.
Subsidiary of LAMBERT BROS., INC.
Liberty, Tenn.

Two of these 150 KW Murphy Diesel Generator Sets power Acme Stone Company's entire plant, except the rolls. Operating 10 hours a day, the plant averages 2000 tons of sized road stone for relocation of State Highway 57.

In selecting power for profitable operations, Acme Stone Co. follows the lead of its parent company, Lambert Bros., Inc. Operating extensively in Tennessee and Ohio, Lambert Bros. *specifies Murphy* for generator or auxiliary power for crushing plants.

It will pay you to follow the lead of successful operators like Acme and Lambert. Ask your Murphy Diesel Dealer to show you how Murphy Diesel's economy of operation and dependability in heavy-duty service helps keep profits high and costs low.

Wherever your job is located, there's a dependable Murphy Diesel Dealer nearby. You can count on him for prompt, expert maintenance and parts service.

380N

MURPHY DIESEL

HEAVY-DUTY POWER for Construction

Murphy Diesel engines and power units are available in sizes from 96 to 264 H.P. with engine speeds of 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

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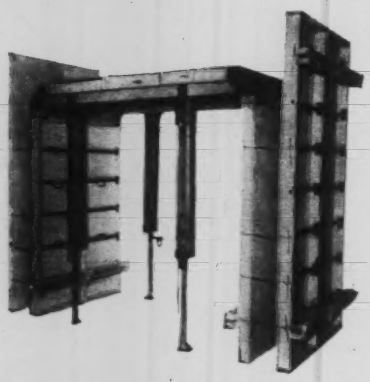
Throughout the Nation

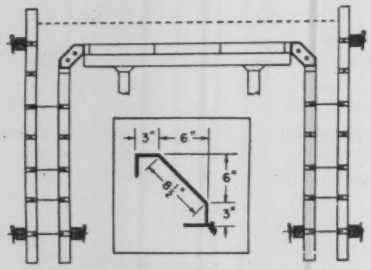
Culvert Forming



Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface 8½ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

Symons forms, shores and column clamps may be rented with purchase option. FREE literature on Symons products is available upon request.

Symons

SYMONS CLAMP & MFG. CO.

4265 Diversey Avenue, Dept. E-8

Chicago 39, Illinois

ENGINEERING NEWS-RECORD

EIGHTY-FOURTH YEAR OF PUBLICATION

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ENGINEERING NEWS-RECORD, Vol. 160, No. 20, MAY 15, 1958

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Publication Office, 99-129 North Broadway, Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices, McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20.00 per year, payable in advance. Second-Class mail privileges authorized at Albany, New York. Printed in U.S.A. Title registered in U.S. Patent Office.

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SUBSCRIPTIONS: Send subscription correspondence and change of address to Subscription Manager, ENGINEERING NEWS-RECORD, 330 W. 42nd St., New York 36, N. Y. Subscribers should notify publisher promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from a recent issue of the magazine. Please allow one month for change to become effective.

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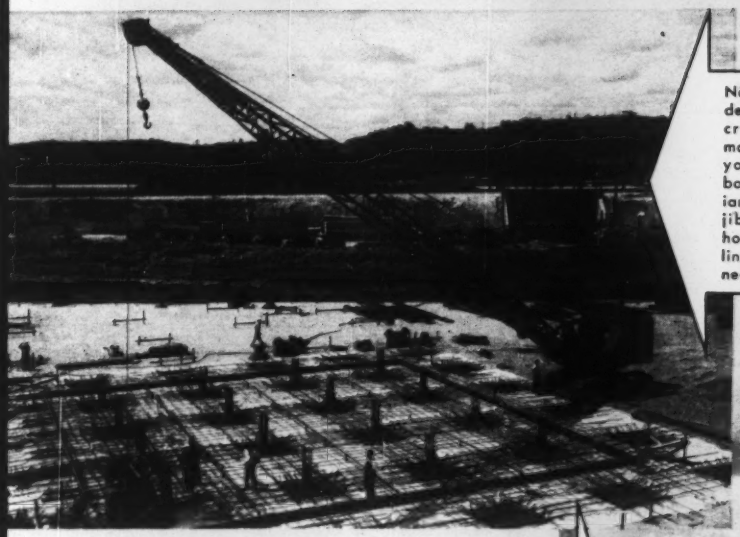
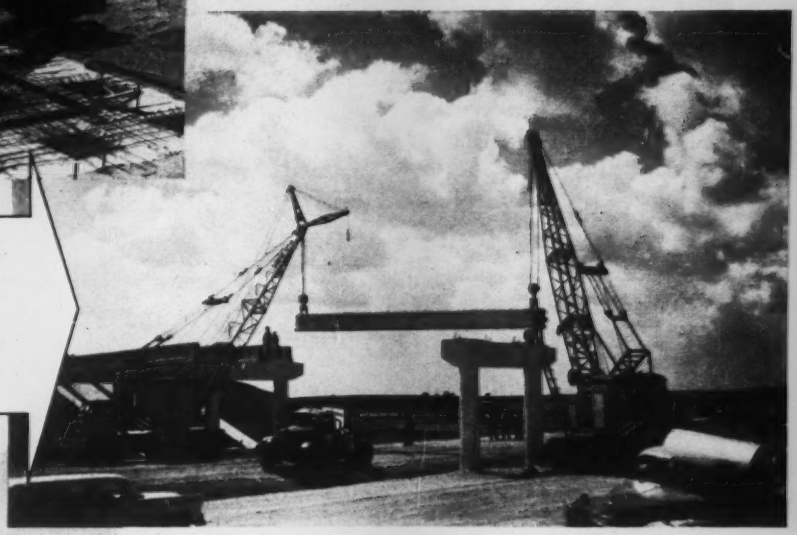
The secret of Real Output

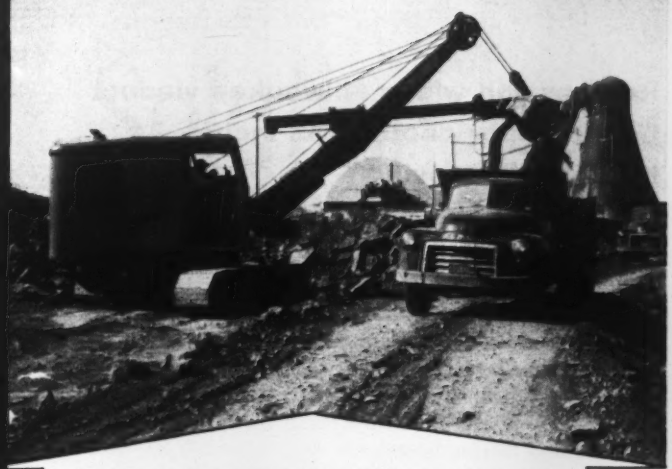
—Always Ready to Go!



Northwest cranes are designed to meet any crane problem you may have. They bring you a full range of boom hoist and auxiliary equipment such as jibs, sectional boom hoist rigging, pendant lines, etc. What do you need?



Northwest Truck Cranes come in 25 ton capacity and 35 ton capacity. Pivoted gantries, High Speed Boom Hoists, Pendant Lines, Telescopic Boom Struts, Removable Counterweight and many other advantages are available.



All Northwests are Rock Shovels. They bring you advantages for Rock digging such as the Northwest Dual Independent Crowd, the Cushion Clutch, the Feather-Touch Clutch Control, Uniform Pressure Swing Clutches and other advantages that help produce output in rock and make easy digging easier.

YOUR equipment may look like a cyclone for speed *when it's running* but it's the output at the end of the month that counts. That's when the real yardage shows up. Remember even small shutdowns can total into costly losses! Your Northwest is *always ready to go.* We hear it everywhere and *Northwest users will tell you so!*

From the easy starting qualities of its properly engineered power plant to Northwest ease of convertibility, Northwest equipment has demonstrated a dependability that has made one out of every three Northwests sold a repeat order.

Heat Treated Cast Steel Machinery Bases, the Cushion Clutch, Uniform Pressure Swing Clutches, the Helical Gear Drive, the Feather-Touch Clutch Control that gives ease of operation free of the complications of compressors, pumps and other delicate mechanisms, all combine to give performance when it's needed.

Your Northwest is always ready to go when called upon. There is no greater quality for earning a profit!

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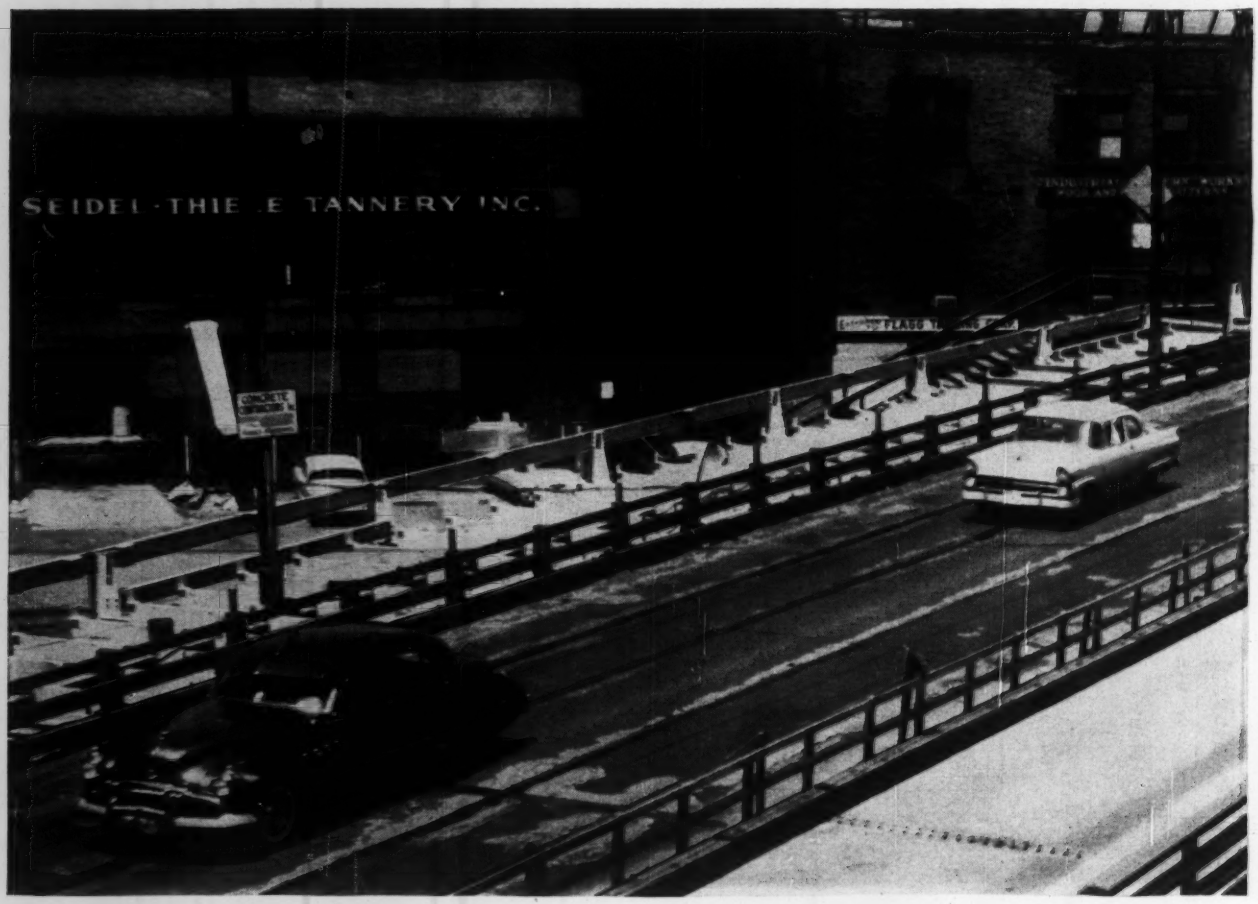


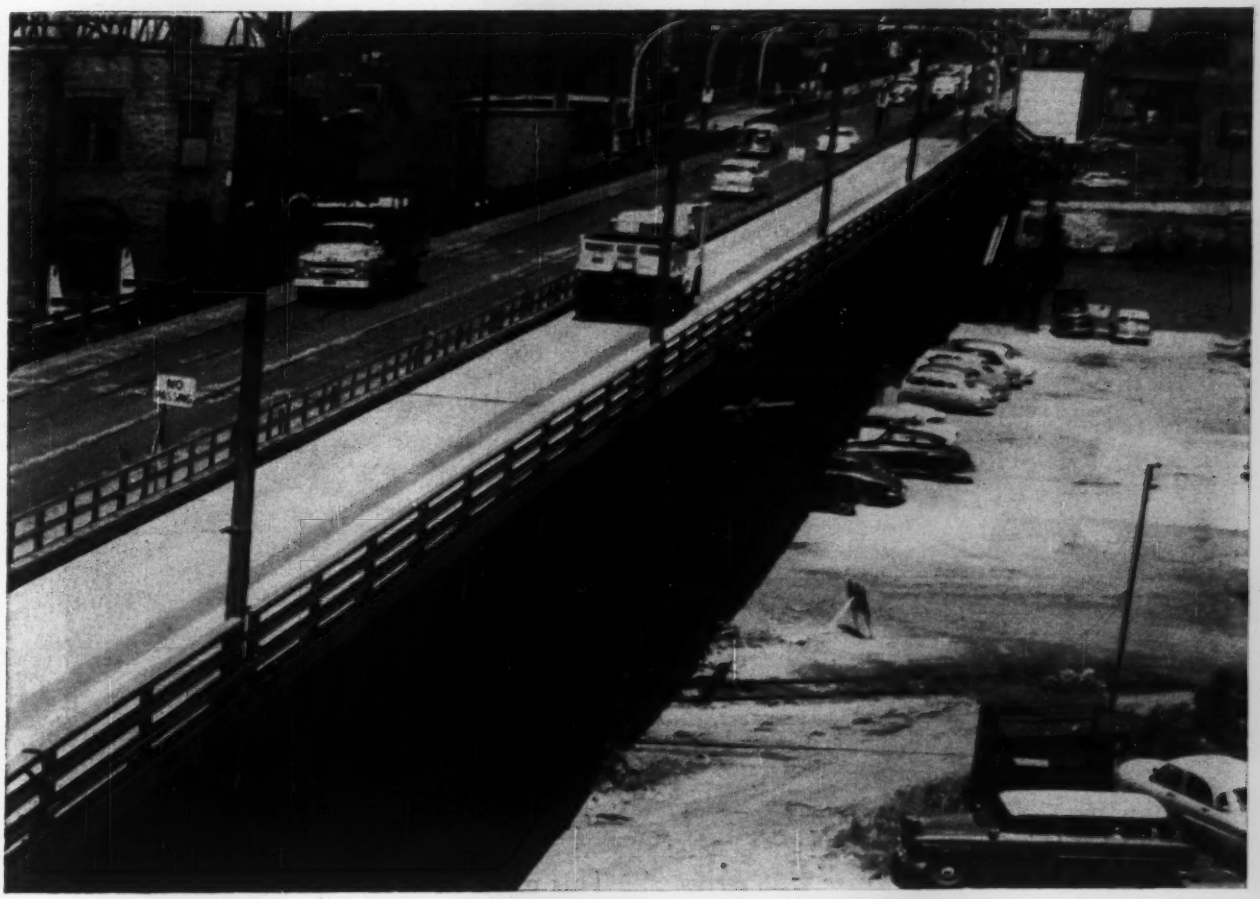
Problem:

Re-floor and widen Milwaukee viaduct
Confine floor depth to 12 inches
Keep traffic moving

Floor replacement on the South & Sixth Street Viaduct in Milwaukee presented some challenging problems: the new roadway, including stringers, could not exceed a minimum rise of 12″; the new floor had to be light enough to permit the use of economical brackets to support 6′ extensions on both sides of the roadway; and traffic had to be maintained during erection.

This job, an impossibility for conventional slab

Fast, easy erection helps get job done in record time, minimizes traffic interference. Strong, lightweight sections of USS® I-Beam-Lok are dropped in place and then welded using ordinary field equipment. Since no concrete forms are used, the time required for their building, placing and removing is saved. The concrete is simply poured and tamped down into the I-Beam-Lok openings, making a firm, smooth surface. Designed by City of Milwaukee Bureau of Bridges and Public Buildings. Erection by Concrete Contractors, Inc., Lakeside Bridge & Steel Co., and J. C. Theilacker Co.



Solution: USS AmBridge I-Beam-Lok

construction, was a natural for 3″ filled AmBridge* I-Beam-Lok flooring. This shallow, lightweight flooring permitted the use of small 8″ stringers, as well as light, economical brackets to support the extensions. So I-Beam-Lok*, even with an overfill, met the specs with space to spare.

Furthermore, the 166 tons of 3″ I-Beam-Lok used here (19,935 sq. ft.) saved more than its own weight in dead load—279 tons. And this doesn't include additional tons saved through use of lighter stringers and brackets.

If you are designing a bridge floor, there's a size or type of AmBridge I-Beam-Lok that will solve your problem or serve your purpose—better. 3″ filled. 4¼″ filled. 5″ open. They all save weight. They all save time. They all save trouble. Write for our 32-page booklet which covers the design and erection of this lightweight flooring.

American Bridge Division of USS United States Steel

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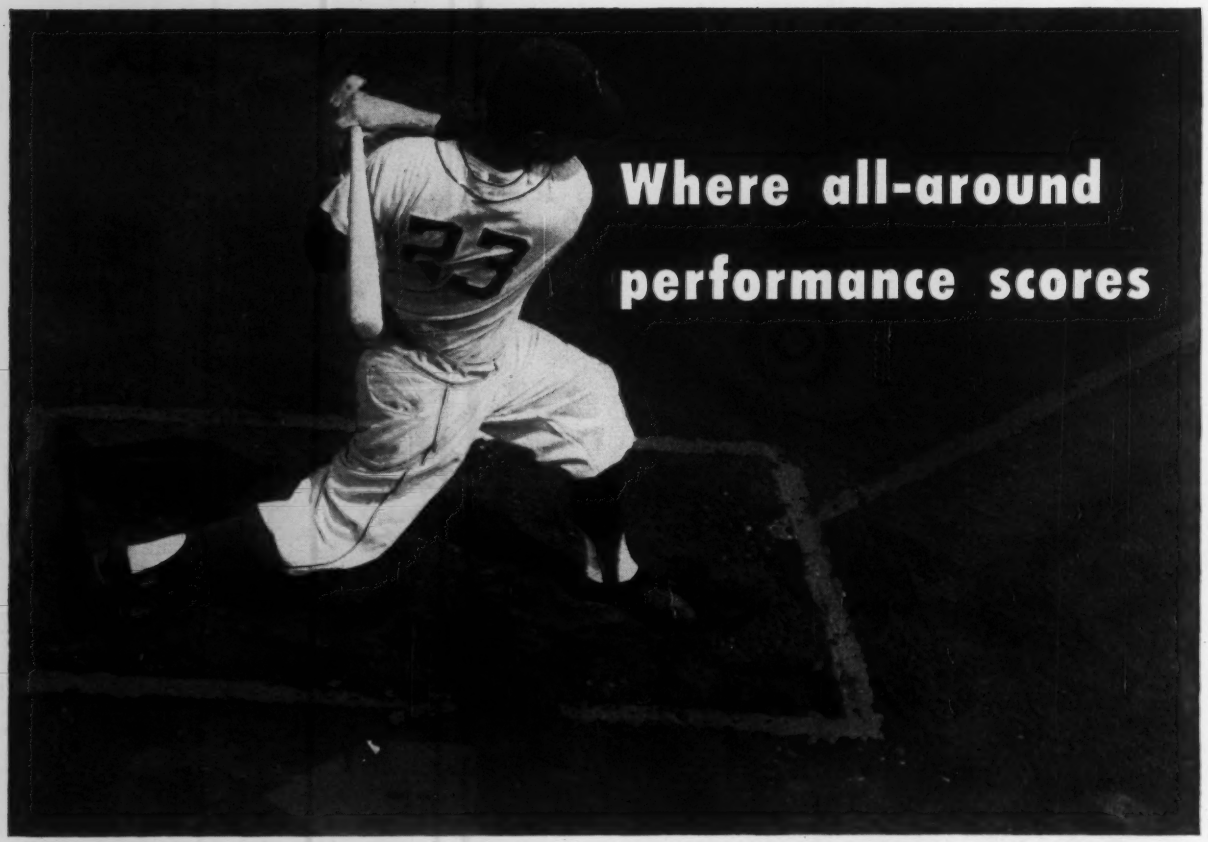

Permalube All-Purpose Grease #158 serves many purposes, proves best for chassis lubrication, universal joints, water pumps and wheel bearings.

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This multi-use, high quality lubricant assists users in cutting down on the number of greases carried. Thus, with Permalube All-Purpose Grease #158 available, a single product does the job. It is not necessary to carry an inventory of separate lubricants for chassis lubrication, universal joints, water pumps and wheel bearings. Truly, Permalube All-Purpose #158 is a multi-purpose grease.

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MOVING 47 MILLION YARDS TO BUILD DRY-LAND RAILROAD ACROSS GREAT SALT LAKE!

TIRE MAINTENANCE A MUST — on-the-job experts, on 24-hour call, help keep the fleet rolling. Strategically located, well-equipped, well-manned service like this cuts down time to a minimum wherever Goodyear helps jobs roll.

HERE, MORRISON-KNUDSEN has 600 men and a $15,000,000 array of tools at work "converting" salt water into road-bed. End dump trucks—bottom dump trucks—plus barges, dredges, conveyor belts and electric shovels—are high-balling a causeway 13 miles long, 180′ to 480′ base-width and as much as 70′ above lake-bottom footing. At left is one of these trucks, picking up riprap from borrow. Tires are Hard Rock Lug by Goodyear.

Triple-Tough 3-T Nylon Cord—

*the **extra** durability **exclusive** with*

Off-The-Road Tires by Goodyear!

Like steel, tire cord must be *tempered* to be tough. Goodyear's exclusive process, involves *Tension, Temperature* and *Time, triple-tempers* cord to make it TRIPLE-TOUGH—for longest tire life, lowest cost-per-yard.

From treads to beads, Goodyear off-the-road tires bring you the most advanced and experienced design, engineering and construction known today.

High among Goodyear's exclusive advancements is TRIPLE-TOUGH 3-T NYLON CORD—called the greatest tire *saver* in 23 years.

Only Goodyear off-the-road tires have it—yet they cost no more than other makes built with ordinary Nylon cord.

And on-the-job savings have been spectacular—on some of the toughest jobs on earth!

Try TRIPLE-TOUGH 3-T NYLONS on *your* toughest jobs. You'll agree that "Goodyear is There"—in every way! Goodyear, Truck Tire Dept., Akron 16, Ohio.

60 *Buy and Specify*

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

All-Weather, Road Lug, Sure-Grip—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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new SHLAGRO Moment Contour Beam and Girder

The SHAPE of THINGS to COME is HERE . . . with the extra-load producing profile of the new Shlagro Moment Contour Beam and Girder! This versatile new structural shape, with depths from 36" to 72", effectively meets the ever-changing requirements for higher carrying capacities — with the same weight of steel. Beam and Girder may be curved, tapered, shaped to solve many structural problems **economically**, especially in bridges and structures that need greater column-free area. **Write today for Catalog #800.**

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title_____

Please attach to your professional letterhead and mail to EN-5
SHLAGRO STEEL PRODUCTS CORP.
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Reader Comment

Union Label for Drawings

SIR—My compliments on your editorial "Completely Out of Order" (ENR April 3, p. 128), referring to the request of a group of engineers affiliated with AFL-CIO that their union label be placed on engineering drawings —and its being turned down. Particularly, I like your point that drawings are not articles in commerce or commodities, but "graphical expressions of technical conclusions reached by a professionally competent engineer, who signs his name to attest to his responsibility", etc.

"Except for the name of the owner and the title of the drawing, no stamp or insignia other than that of the engineer responsible for the design should appear on engineering drawings." Very sound.

When drawings are applied to represent reputed acts of things not capable of acting, or to advertise such a thing, whether it be a corporation, a government agency, or a union, it shows that the user is either careless with his words, or deliberately distorting the truth to mislead someone.

C. O. CLARK
Tulsa, Okla.

Union Labels

SIR—Congratulations on the editorial "Completely Out of Order" (ENR April 3, 1958, p. 128). It draws a clear line of separation between labor union aggressiveness and professional dignity and responsibility.

It occurs to me that if a damage suit arose from errors in drawings carrying a union label, the union might be held as a party to the suit.

NORMAN DE WIND
Annapolis, Md.

Computer Service Firms

SIR—In reading the article "Tips on Organizing Computer Operation" (ENR Mar. 27, p 43) I was rather amused by the Parsons, Brinckerhoff, Hall and Macdonald representatives casting aspersions on service bureaus after they had just finished describing how they had, in reality, set up a service bureau within their firm. The only difference is that they have closer control, but I think that such control is a high price to pay to forego the wider and more comprehensive point of view an independent service bureau brings to bear on a problem.

The other benefit which most organizations derive from service bureaus is the spreading of the fixed costs of the equipment over many jobs. To the small firms who make up the majority of the engineering firms in the country the high overhead associated with renting and electronic computer is a crushing burden. By using an independent service bureau these small firms can still reap the benefits of electronic computing. Without the service bureaus the small firms would not be able to use electronic computing at all.

CLARENCE L. HALL
Manager Electronic Computing and Data Processing Center
Anaheim, Calif.

For Architects Only

SIR—Re "Denver Engineers Can't Design Buildings" (ENR Jan. 23, p.17) concerning Denver's ordinance requiring that plans for all public and semi-public buildings must bear the seal and signature of a state licensed architect:

To the architects in the city of Denver I extend my congratulations on the fact that they were able to get such a law passed in the first place.

To the engineers of Denver, if it is any consolation, I say your apparent apathy to the situation at the time the law was passed is probably no worse than it is elsewhere in the country.

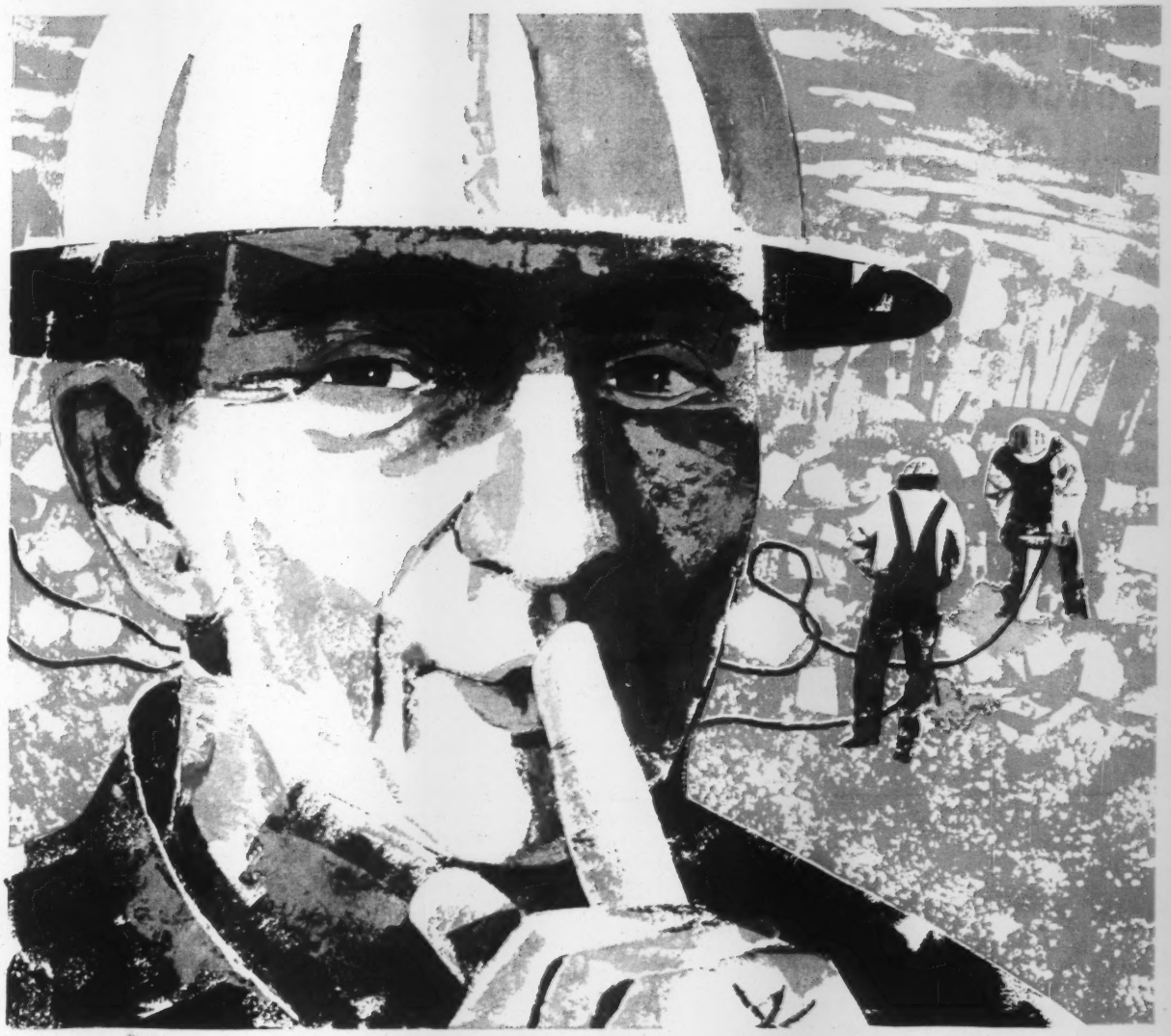
JAMES W. O'CONNOR, JR.
Professional Engineer
Springfield, Mass.

Missile Base Monopoly?

SIR—Your lead article on Missile Bases (ENR Feb. 27, p. 21) reveals the monopoly that Los Angeles engineering firms enjoy in General Bernard Schriever's missile base design program. The award of both Atlas base contracts to Holmes and Narver and the Thor and Titan contracts to Daniel, Mann, Johnson and Mendenhall smacks of favoritism which should be investigated.

It is my understanding that the first Titan base is to be constructed in the Great Lakes Region. If this be true, then the employment of a Los Angeles firm is the more reprehensible. Parts of the Titan are being manufactured all

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



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Quality Explosives and Technical Assistance . . . so that you achieve maximum blasting efficiency, yet reduce noise, shock and vibration to the minimum.

"Good Will" Techniques . . . that will help *prepare* the community psychologically before you blast.

These quality materials and services are at the beck and call of every Cyanamid customer. Our plants and magazines are conveniently located for rapid delivery right to your operation. For more information, see your nearest Cyanamid representative, or write to

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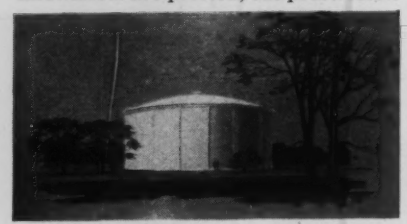
Prestressed Concrete Tanks Show Big Savings

Maintenance Costs Cut By 75%

Over a 50 year service life, a prestressed concrete tank will show a 75% saving in total maintenance costs over a steel tank of the same capacity. In today's economy, such a long range saving has tremendous appeal to municipalities and water companies throughout the world. When your tank requirements are in the planning stage, these calculated maintenance costs should be considered. Average yearly maintenance on a 3,000,000 gallon steel tank is estimated at $2500 per year at current prices. For a prestressed concrete tank, maintenance is negligible; however, occasional painting for color effect may be desired.

When the charges for servicing the initial cost plus relative maintenance allowances are plotted, the prestressed



concrete tank will often show a lower out of pocket cost to the owner in less than 5 years. When these costs and their increases are extended for an expected service life of 50 years, the savings to the owner with prestressed concrete are enormous.

The prestressed concrete tank is also a good looking tank . . . it is inherently strong and extremely stable . . . it is designed and built for permanence.

And, 75% of the contract price is spent right in your local community . . . construction is done with materials and labor available locally.

Write today for more information on Preload Prestressed Concrete Tanks.

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PRELOAD CONCRETE STRUCTURES, INC.
837 Old Country Rd., Westbury, L. I., N. Y.

PRELOAD MIDWEST CONSTRUCTION CO.
2211 East 19th Street, Kansas City, Mo.

HERRICK IRON WORKS
28400 Clawiter Road, Hayward, California

THE PRELOAD COMPANY, INC.
Jefferson Tower Bldg., 351 Jefferson, Dallas, Tex.

over the U. S., and according to the map published by LIFE magazine a few weeks ago the assembly of this ICBM will be made in eastern Colorado.

In your article, Air Force Research and Development Command was quoted as desiring to have the engineering firm close to the manufacturer of the missile. Eastern Colorado is just a few hundred miles closer to Los Angeles than it is to Chicago, Detroit, New Orleans, St. Louis and other cities which have engineering firms just as well, and perhaps better, qualified than DMJ and M to do the job. This seems to me to negate any argument about the proximity of the engineering firm to the missile fabricator.

There is nothing extraordinarily complex about the structural and mechanical techniques which have been evolved in the design of missile facilities, yet the Air Force states that the Cooke installation will be a training ground for the consulting engineering firms.

In other words, the monopoly shall be perpetuated.

Now, new brainpower on the problems of missile base design might produce improved solutions while simultaneously broadening the national base of knowledge. This appears to be a wiser policy to pursue than one which restricts know-how to a few firms. (I noted, of course, that Rust Engineering and Silas-Mason Co. and Leo A. Daly Co. have been awarded a slice of the pie).

In addition, I ask ENGINEERING NEWS-RECORD why it refers to the Missile Base Engineers as "Architect-Engineers"? How much architecture is employed in the design of a missile base? Obviously, the design is essentially structural, mechanical, civil and electrical. It is odd that a publication which has served the engineering profession and the construction industry so faithfully throughout the years would use this expression in preference to the applicable one, in this instance, "Consulting Engineer."

JOHN M. GANTRY
Consulting Mechanical Engineer
Cleveland, Ohio

EDITOR'S NOTE—Architect-Engineer in this case is accepted federal nomenclature.

Scotch Pine Isn't Sequoia

SIR—Your interesting article on the British-built warped wood shell (ENR Mar. 27, p. 53) might slightly confound the American reader, accustomed to our domestic redwood, *Sequoia sempervirens*. "European redwood" refers to the nomenclature of the British Standards Institution and identifies a wood botanically classified as *Pinus sylvestris*, native to northern Europe and western Siberia. Known both here and abroad as Scotch pine, it is a popular construction timber in the British Isles.

BERNARD F. DOUGHERTY
New York, N. Y.

Construction Supervision

SIR—For some reason or other you overlooked our firm in assembling information for your interesting article on the supervision of construction entitled "Consultants Look For More of It" (ENR Mar. 6, p. 25).

We have always taken the position that we should supervise the construction of all projects which we design. During the years, we have done this with only one or two minor exceptions. Our supervision of construction constitutes complete service involving the setting of stakes for the work, the furnishing of a resident engineer and competent inspectors and providing supplemental construction drawings as needed. We generally arrange for shop tests of equipment such as penstocks, turbines, generators and, in some cases, valves and gates. In our opinion the function of the consulting engineer related to the investigation, conceiving and designing of projects does not terminate after he has prepared plans and specifications and assisted the owner in obtaining bids and letting a construction contract. Nor is the mere consulting during construction and checking of shop drawings adequate.

In the field in which we operate, which is confined largely to water development, changes must frequently be made during construction because of changed conditions in the field. Many of these changes require the same degree of technical consideration that was given to the original conception and design of the project. These changes should be made in such a fashion as to be consistent with the original intent of the engineer and his client. In order to insure his client that this is done and in order to protect the engineer, there should be delegated to him the function of technical supervision of construction of the works which he has designed.

As for compensation, we are inherently opposed to a percentage type of arrangement even for design. If the scope of the project is well defined, we prefer a lump sum fee for services rendered in connection with design, preparation of plans and specifications, and assistance to the client in contracting the work. However, a lump sum fee is not applicable to the services ren-

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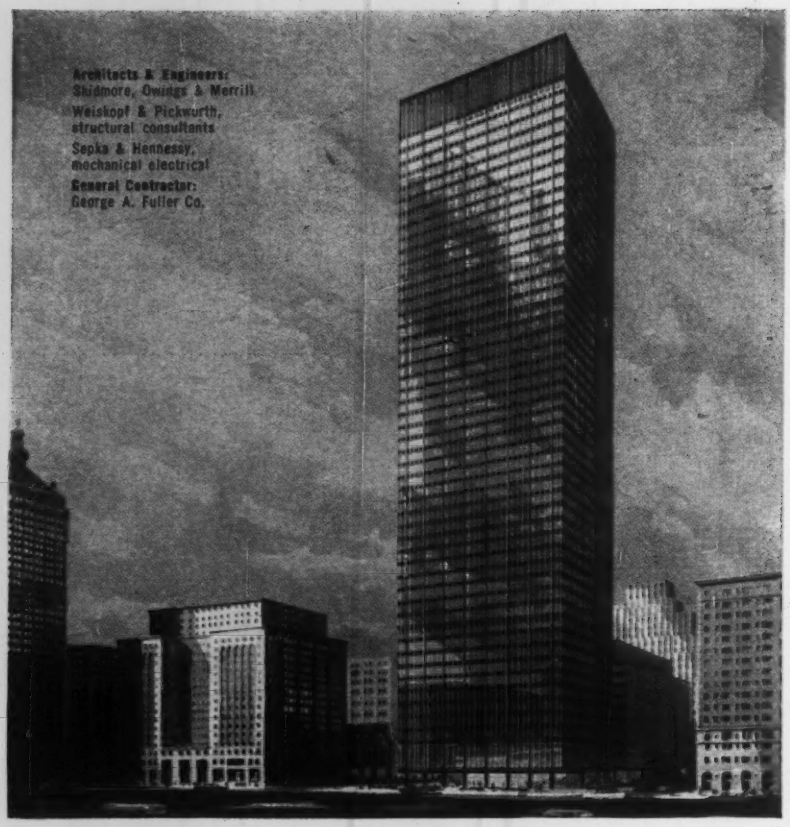

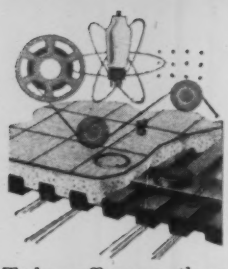

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52-story Union Carbide Building will STAY modern with Milcor Celluflor — 900,000 square feet of it!

Today, offices use three times as much electricity as they did only 10 years ago. With the growing trend toward electronic office equipment, they're bound to use even more in the years ahead. That's why architects of the Union Carbide Building specified Milcor Celluflor.

It provides for complete electrification of floor areas. Cells spaced six inches o. c. serve as raceways to handle complex cable systems for power and communications. Outlets can be installed anywhere on the floor. They can be relocated or new ones added — or circuits can be changed — without costly alterations.

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C-9

dered in connection with the technical supervision of construction because many of the conditions surrounding the construction are not under the control of the engineer. We find that the repayment of costs plus the payment of a fixed fee has been very satisfactory with us and with our clients. We have a number of contracts at the present time containing such provisions. These contracts cover the supervision of construction of projects with which we are identified in the state of Colorado and in three South American countries.

We have a total of 160 personnel in our two organizations of Tipton & Kalmbach, Inc., and R. J. Tipton Associated Engineers, Inc. Sixty-one of the employees are in the office and 99 are in the field. Because of the nature of most of the projects with which we are presently identified, it so happens that the field personnel outnumber the office personnel; generally the reverse is true.

R. J. Tipton
Consulting Engineer
Denver, Colo.

Supervision

Sir—In your article "Consultants Look for More of It" (ENR March 6, 1958, p. 21), consultants generally expressed an eagerness to supervise the construction of projects on which they had made the design. Since we have had some good and also some very bad experiences doing the work when the consultants were the supervisors, it might be of interest to the trade to conduct a survey of contractors to obtain their reaction. Quite obviously the greatest difficulty comes when the consultant refuses to admit to a mistake on his part.

M. C. Harrison
President
Harrison Construction Co.
Pittsburgh, Pa.

CALENDAR

Western Association of State Highway Officials, 37th annual meeting, Hotel Utah, Salt Lake City, Utah, June 3-6.

National Society of Professional Engineers, annual meeting, Chase-Park Plaza Hotels, St. Louis, Mo., June 11-14.

American Society for Testing Materials, 61st annual meeting, Hotel Statler and Sheraton Plaza Hotel, Boston, Mass., June 22-27.

American Society of Heating and Air Conditioning Engineers, semi-annual meeting, Pick-Nicollet Hotel, Minneapolis, Minn., June 23-25.

American Society of Civil Engineers, Multnomah Hotel, Portland, Ore., June 23-27.

American Institute of Architects, annual convention, Hotel Cleveland, Cleveland, Ohio, July 7-11.

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Built stronger... yet designed lighter to reduce your hauling costs!

Extra hauling profit is a built-in feature of ANTHONY Dumping Equipment. That's because every ANTHONY model—Hoists, Bodies and Trailers alike—is *engineered* to give you up to 12% extra legal payload on every trip you make.

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CP TRACDRIL

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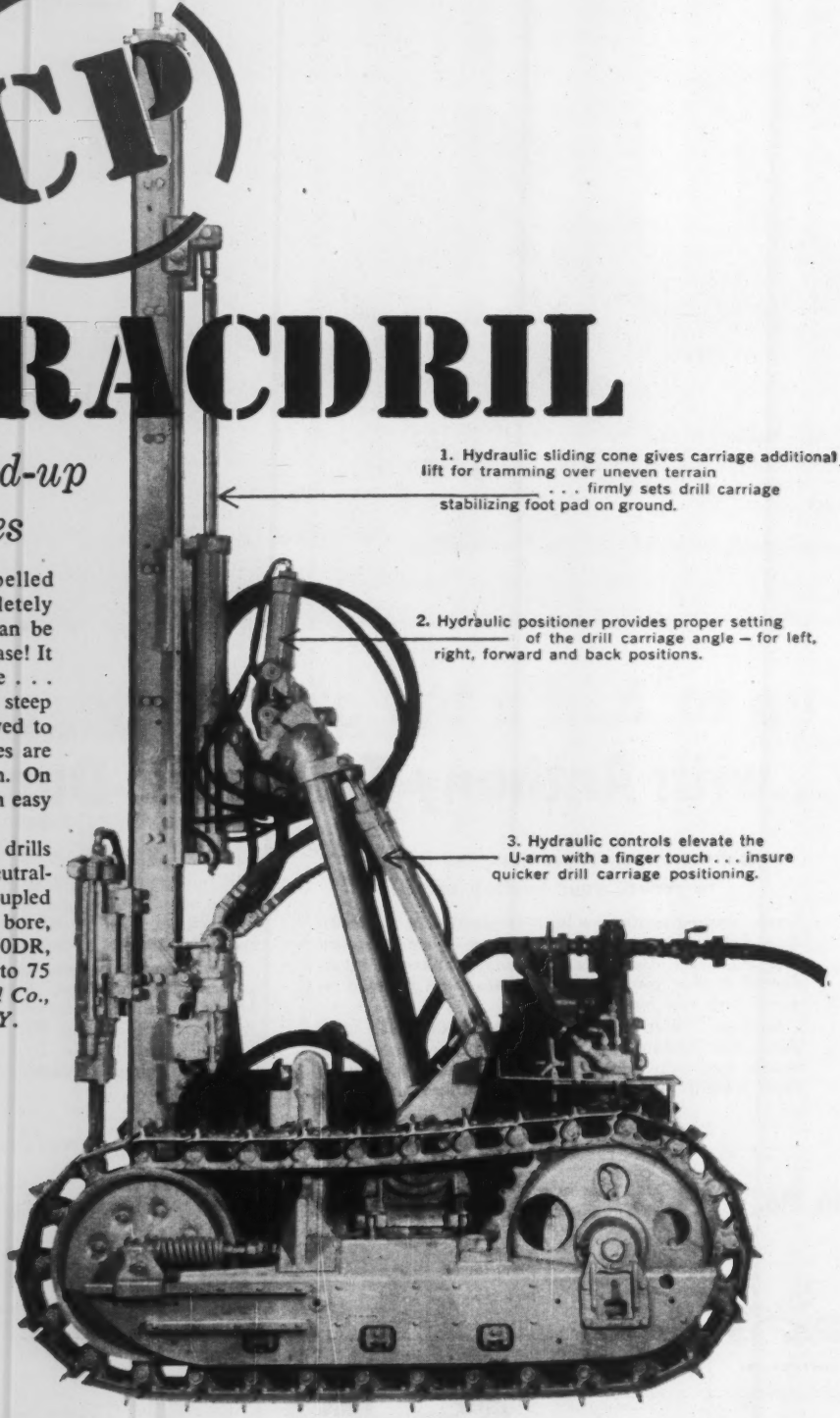
This new G-800 self-propelled Tracdril provides a completely mobile drill mounting . . . can be "spotted" into position with ease! It takes uneven ground in stride . . . tows its own compressor up steep grades. With feed motor moved to rear of drill carriage, toe-holes are started only 6" from bottom. On top-holes, drill controls stay in easy reach.

Two heavy-duty deep-hole drills now available with standard-neutral-reverse rotation for use with coupled steel: CP-400DR, 4" cylinder bore, 2½" holes to 50 feet; and CP-450DR, 4½" cylinder bore, 3" holes to 75 feet. *Chicago Pneumatic Tool Co., 8 East 44th St., N. Y. 17, N. Y.*


1. Hydraulic sliding cone gives carriage additional lift for tramming over uneven terrain . . . firmly sets drill carriage stabilizing foot pad on ground.
2. Hydraulic positioner provides proper setting of the drill carriage angle — for left, right, forward and back positions.
3. Hydraulic controls elevate the U-arm with a finger touch . . . insure quicker drill carriage positioning.

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A REMINDER:

All papers for the $1000

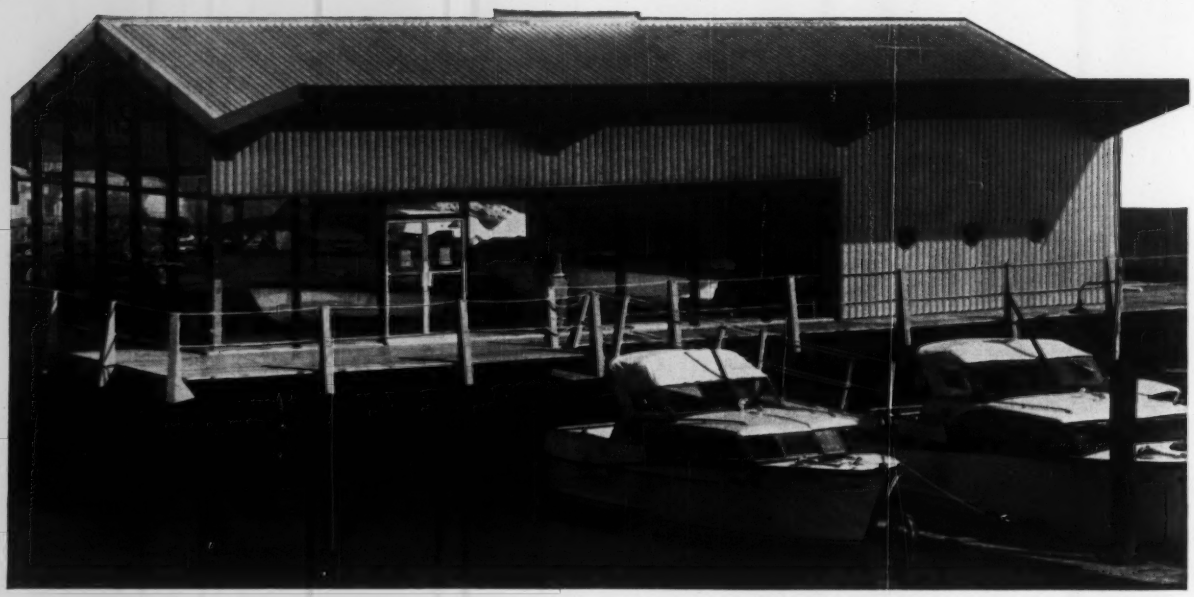
ALFRED A. RAYMOND AWARD COMPETITION

must be submitted by September 1, 1958

An award of $1,000 will be given annually in honor of Alfred A. Raymond, inventor of the cast-in-place concrete pile and founder of Raymond Concrete Pile Company. It will be presented to the author of the best original paper on "Design and Construction of Foundations for Structures," as selected by a committee of eminent judges. Authors of manuscripts, to qualify, must hold a degree in engineering from an accredited institution.

The topic "Design and Construction of Foundations for Structures" is to be interpreted broadly. It covers all phases of foundation engineering from the initial planning to the final installation of a foundation for a structure. Engineers are cordially invited to submit a paper on whatever aspect of foundation engineering or construction of foundations will contribute to knowledge in the field. Manuscripts may deal with foundatior test borings, soil mechanics, the theory of foundation design, actual foundation construction, either temporary or permanent, and other related subjects.

If you are a practicing engineer, engineering faculty member or a graduate student and wish to compete for this award, simply write for a complete set of detailed regulations: Dept. E-8, Alfred A. Raymond Award, Room 1214, 140 Cedar Street, New York 6, N. Y.



Boat dealer gets shipshape showroom and offices in a trim 32′ x 60′ Stran-Steel Rigid Frame building. Owens-California Yacht Sales, Bethel Island, Calif.

Landside view of Owens-California Yacht Sales illustrates attractive blend of steel and glass.

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Handsome site-styled design from standard parts!

Buildings custom-styled for function and beauty plus volume production savings! Stran-Steel gives you rugged all-steel construction in the dimensions you specify, pre-engineered for fast erection. Buildings go up in days, stay up for decades with low operating costs, low maintenance!

The interiors of these firesafe, weather-tight structures are free of columns, full of clear-span space that's ideal for factory, warehouse or retail store. They'll take cranes or monorails, are easily insulated, and combine effectively with other materials —like brick, wood or glass.

Financing is easily arranged with your Stran-Steel dealer. And it takes only one-fourth down on his 5-year purchase plan—with foundation, erection cost and tax included. Mail the coupon for more information or call your Stran-Steel dealer. He's listed in the Yellow Pages under *Steel Buildings* or *Buildings—Steel*.

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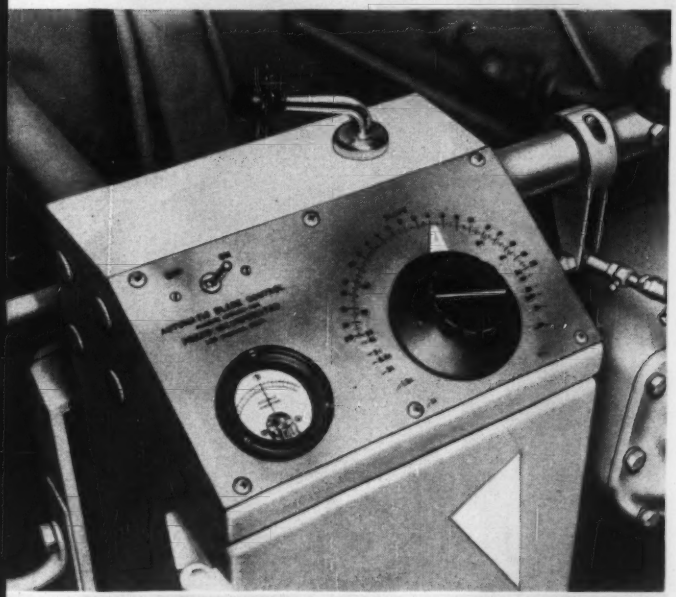
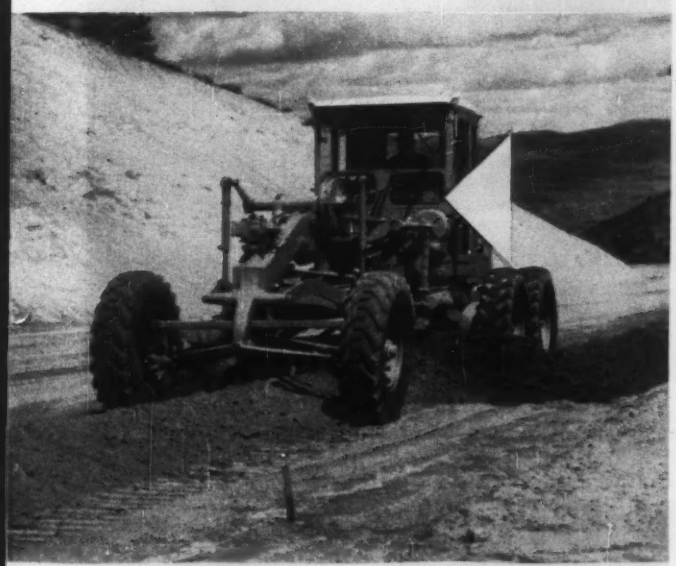
JOB REPORT FROM NEVADA ON

AUTOMATIC BLADE CONTROL

–AVAILABLE ONLY FOR CAT MOTOR GRADERS!



JUST DIAL THE SLOPE ON THIS PRECO AUTOMATIC BLADE CONTROL...



...IT CONTROLS BLADE SLOPE WITHIN ⅛" IN 10', REGARDLESS OF TERRAIN!

From job after job, reports are coming in about the performance of the Preco Automatic Blade Control, a major feature introduced last year for exclusive use on Cat Motor Graders. How's it doing? Here's a typical answer from Superintendent Bill Hanson of Isbell Constr. Co., Inc., of Reno: "Work on finish is easier with the automatic control and is very accurate." His remarks are the result of work on a 9-mile, 4-lane freeway project near Carson City, Nevada. As for accuracy, controlling blade slope *within* ⅛" *in 10'* can be done!

More improvements for the No. 12

Though the No. 12 has earned the reputation of "standard of the industry," Caterpillar constantly looks for and finds ways to improve this machine. Automatic blade control is an example. Here are some other, even more recent improvements:

Longer main frame—a 4¾" longer main frame adds extra clearance between toe of blade and front tire for all blade positions.

Better visibility—31% more glass area in cab increases operator's visibility and efficiency.

Increased operator comfort—new seat adjusts fore and aft. Back rest adjustable, too. Cab 6" higher and cab roof insulated to reduce noise level.

Increased versatility—4" longer tandem provides plenty of clearance for chains even when machine is equipped with large 14.00-24 tires.

Have you seen the improved No. 12?

Because of these and other new features, you can count on the No. 12 for even better work—and faster. Look it over at your Caterpillar Dealer. Better still, look it over in action. Have him demonstrate a No. 12 equipped with automatic blade control. See for yourself how it steps up production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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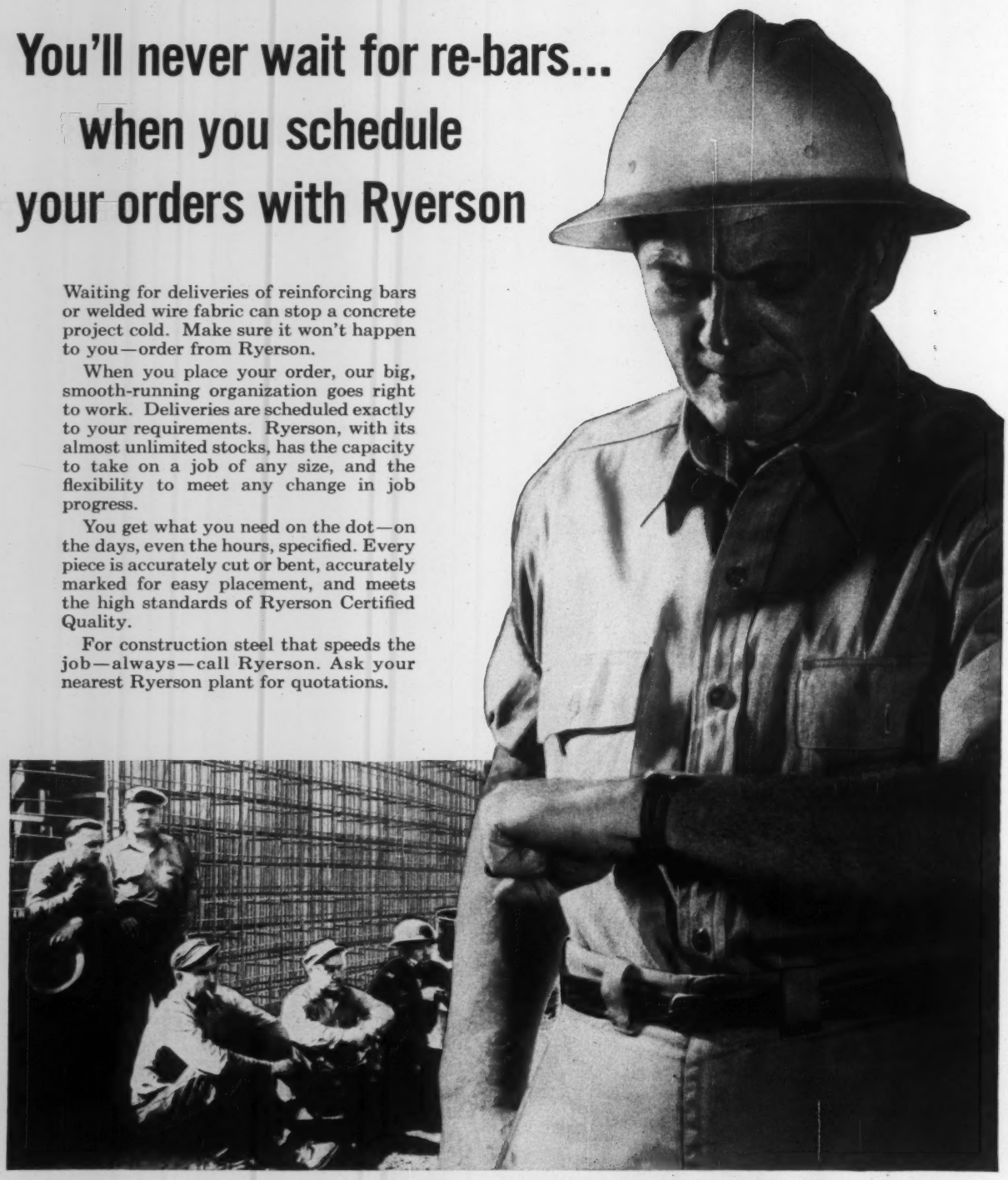
For construction steel that speeds the job—always—call Ryerson. Ask your nearest Ryerson plant for quotations.



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ENGINEERING NEWS-RECORD

Vol. 160, No. 20 May 15, 1958

Number of copies printed this issue, 83,592

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THE CONSTRUCTION WEEK

TRANSPORTATION POLICY STUDY—It's too early to say it shall be done, but it was learned this week that a full-scale study of the nation's transportation facilities—highway, railway, air and water—may be undertaken by Engineers Joint Council on the same scale as it has studied national water policy in the past. The recommendation that EJC tackle the transportation problem came from the executive committee of the American Society of Mechanical Engineers.

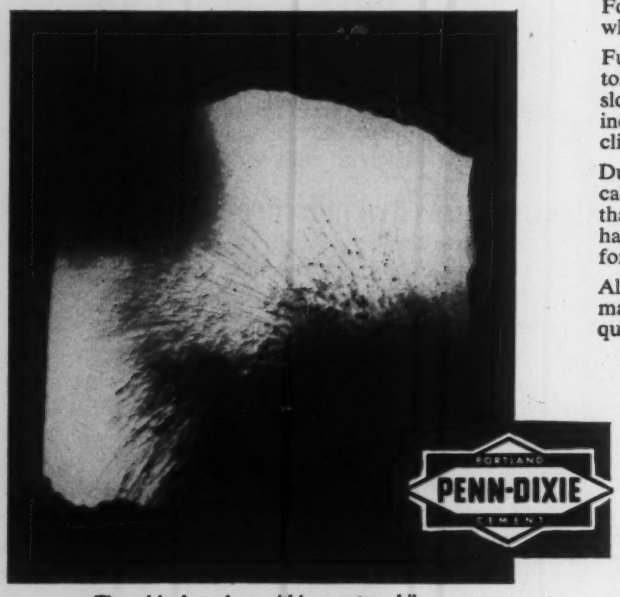
HOUSING STARTS—As ENR completed a 25 city survey pointing to an upturn in the homebuilding segment of the construction industry this week (p. 23), housing start figures for April came from the U.S. Bureau of Labor Statistics to lend substance to optimism. Starts in April were 90,700, bringing up the annual rate to 950,000. And if further optimism is sought: Nels Severin, president of the National Association of Home Builders, said Monday he expects starts to go over one million this year.

CONTRACTOR VIEWS ON LABOR ISSUES—A poll of members of Northern California Chapter, Associated General Contractors of America, indicates almost unanimous support of the position taken by national AGC spokesmen on four major labor issues: 96% favor opposition to compulsory unionism and support of right-to-work laws banning the union shop; 100% are in favor of opposition to industrial union demands that restrict use of outside contractors on in-plant construction work; 100% are in favor of outlawing secondary boycotts; and 96% favor federal legislative action to curb vandalism.

CONTOURS BY ELECTRONICS—Highway engineers who have seen it are enthusiastic over the latest addition to mechanized mapmaking, previewed by ENR in Toronto last week. Called AUSCOR (for Automatic Scanning Correlator), this exciting electronic substitute for the operator of the stereoscopic plotting machine was unveiled by Photogrammetric Survey Corp. Just how it finds ground elevations from air photos will be described in an early issue.

CONTRACTOR GROUPS MAY MERGE—The Mechanical Contractors Association of America and the National Association of Plumbing Contractors will combine next year if the members agree with the executive committees. At the coming meetings, scheduled by midsummer for both organizations, the committees will present a resolution to their respective boards of directors calling for the preparation of consolidation plans for submission to the respective national conventions in 1959.

Penn-Dixie Stages an Inferno Inside the Rotary Kilns



The white-hot glare within a rotary kiln.

Looking into a fiery rotary kiln is like looking directly at the sun; dark glasses are essential.

For in these revolving cylinders raw material is burned at a white-heat temperature exceeding 2,600° F.

Fuel is blown into the kiln under pressure and roars in tongues of flame 30 to 40 feet long. As the material passes slowly down thru the kiln, it becomes incandescent as heat increases and takes the form of marble-sized lumps called clinker.

During this burning operation the material changes chemically as well as physically and emerges from the kiln harder than the raw materials from which it came. After the clinker has cooled, it goes to the finish grinding process or is stored for grinding into cement at a later date.

All kiln operations are controlled electronically, as well as manually, thus assuring uniform clinker for Penn-Dixie's quality cements.

Penn-Dixie means Permanent Dependability

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WASHINGTON OBSERVER

- **Construction outlook strong**
- **Fulbright bill pushed**
- **Public works veto opposed**

● **The construction outlook is really strong, according to the Business Advisory Council.** This is the group of blue-chip business leaders who confer three or four times a year with top Cabinet officials on the business outlook and business attitudes toward government policies. They met with Administration officials over the weekend.

Top construction executives reported that more construction projects have been cleared for advance planning recently than for several months—which in effect guarantees a substantial construction upswing beginning six months to a year from now.

The business leaders put their backing behind plans to give faster tax write-offs for new plant and equipment as a needed tax reform. But they generally stood against any across-the-board tax cut as an anti-recession remedy.

—

● **The Fulbright public works program is getting a new push.** That is the legislation that packages $1 billion in loan authority for public works in the states and localities—water treatment plants, airports, school construction and the like. The Senate voted the measure early in this session as one of the first anti-recession actions it took. But there had been a lag of interest in the last few weeks.

Now the House Banking Committee is preparing to write its version. Chairman Brent Spence hopes to have a bill ready for the House in early June. The work on any changes in the Senate bill will start in a couple of weeks.

Basically, the Fulbright bill provides: Loans to local governments and school districts on a 50 year repayment basis at rates around 3½%. One change the House may make is to reduce the interest rate to 3%. The lower interest charge has Congressman Spence's backing, plus that of Rep. Wright Patman, chairman of the House Small Business Committee and the Joint Economic Committee.

Aid to depressed areas may be added to the legislation. There is a revival of sentiment in Washington to give spot relief in areas hardest hit by the business downturn. Already, the military is putting some extra business into hard-hit industrial areas. Now the House Banking Committee is giving serious thought to a loan or grant program to depressed areas.

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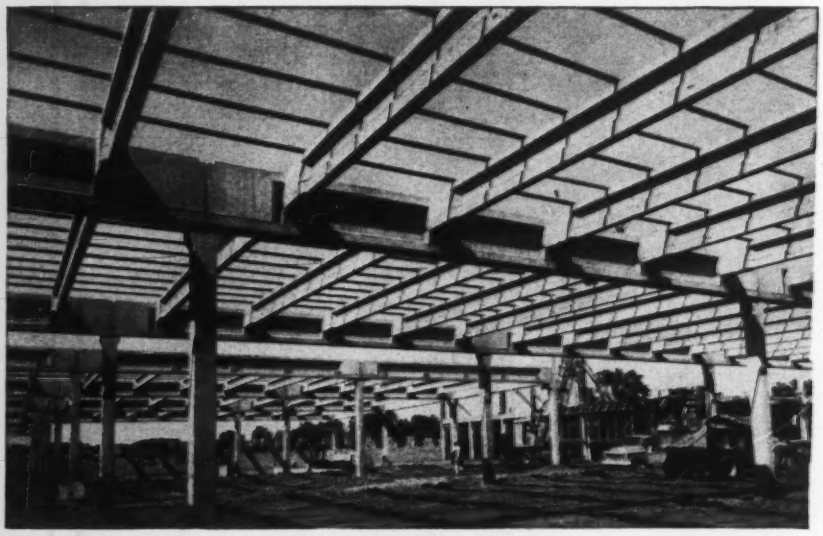
● **Rivers and harbors leaders are going to try to get an override of the President's veto of the omnibus authorization bill.** Chances are small, but the Rivers and Harbors Congress feels the try is worthwhile. A convention of the association in Washington this week is aimed at an appeal to Congress to upset the President's veto—his second rejection of the authorization legislation.

Two other major issues before the convention: Demands for new starts on approved water resources projects, and demands that appropriated funds for water development works be released.

STRESSING
A STRUCTURAL TRIUMPH

Prestressed 'Incor' Structural Members Frame 72,000 Sq. Ft. of New Sanitary Food Plant



● Sanitation and cleanliness are of paramount importance in food processing. How better can these essentials be obtained than with precast, prestressed concrete!

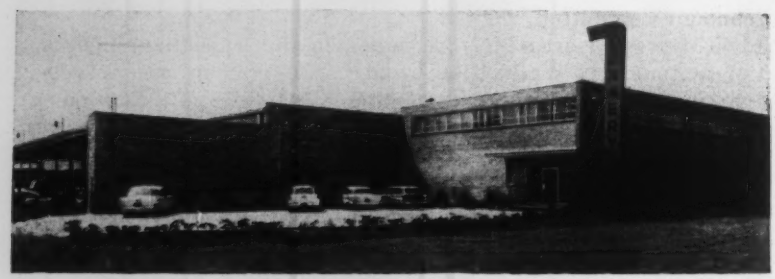
Versatile concrete provides wide-open floor space and streamlined smooth surfaces that keep that new look, and are easy to clean.

Other important advantages inherent in prestressed concrete are low-cost maintenance, economy of erection, and flexibility for expansion through a variety of shapes, sizes, and weights made to order at no premium cost. The bright, light, functionally attractive structures of prestressed concrete are also corrosion-proof, fire-safe and durable—designed for today's needs, yet built for the years ahead.

Noteworthy is this large modern structure which houses the multiple food processing facilities of Charles Dennery, Inc. in Jefferson Parish, Louisiana. Covering 72,000 square feet, the well-designed building contains the plant's varied operations—converting raw materials into packaged food products.

Beams, girders, purlins, and columns were supplied and erected by Belden Concrete Products, Inc. of New Orleans. A quick start and early completion were obtained using 'Incor'*, making possible assembly-line production, fast stripping and re-use of forms—advantages always assured with America's FIRST high early strength portland cement.

*Reg. U.S. Pat. Off.



FOOD PROCESSING PLANT
WAREHOUSE AND OFFICE BUILDING
Jefferson Parish, Louisiana

Owner: **CHARLES DENNERY, INC.**

Architect: **AUGUST PEREZ & ASSOCIATES**

General Contractor
LIONEL F. FAVRET CO., INC.

Prestressed Units Supplied and Erected by:
BELDEN CONCRETE PRODUCTS, INC.
All of New Orleans, Louisiana

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The Housing Market

- **Builders are boosting their production schedules**
- **They are aiming at a low-cost product**
- **Many are expecting to better last year's sales**

Recent Market Sprint Buoys Builders

A sharp reversal for the better has occurred—and is continuing—in the homebuilding industry. During the last five to six weeks, homebuilders have witnessed an upsurge in buyer interest accompanied by an improved rate of sales. According to an ENR survey of cities across the nation, all indicators point to a strong finish this year for the industry, with the improved situation to continue through 1959.

Four trends are clearly apparent:

- The public quickly, and with certainty, is shaking off its recession fears.
- Builders are shifting to, and raising production schedules on houses in the $13,500-and-under bracket. The next best area of operation is $20,000-or-more. While $15,000-to-$20,000 often is described as a "dead market," there are some outstanding exceptions to the last mentioned.
- Now, more than in the last year or two, "starts" are synonymous with sales. Builders generally are selling from model homes, starting to build only when they have contracts signed. This applies to almost all price classes, with exceptions showing up spottily in the $30,000-or-over class.
- Builders are "selling" their product hard, and successfully in recent weeks, primarily by spending more on advertising and utilizing point-of-sale gimmicks—a foreign car given free to buyers, bank deposit made in a buyer's name, payment of one year's mortgage insurance premium, etc.

• Financing was a hitch—The tightening of the mortgage financing market (and to a lesser extent, severe weather conditions) contributed greatly to the housing drop last year. Then toward the end of 1957 and into this year, a slipping economy provided the public with a genuine case of recession jitters.

So, while the availability of money became apparent early in the year, it did little to smooth the path for the builders. A worried public was in no mood to borrow heavily on a long-term basis at a time when recession news took over the pages of its daily newspapers.

This disinterest in borrowing on the part of both public and industry in general, meanwhile, acted to increase the supply of available credit. Mortgage terms and interest rates continued to soften.

Then came the enactment of the emergency housing legislation (ENR Mar. 27, p. 21). Additional funds were added to an already generous pool of funds. Down payments on FHA-insured housing were lowered, the negligible 2% down payment required for VA-guaranteed housing was eliminated entirely and the allowable VA interest rate was raised to 4.75%.

If those actions did nothing else, they encouraged the builder to hit at a market that could most easily be financed and at the same time they aroused the public's interest in new homes.

• Helped along with promotion—The actions also gave builders information that could be splashed prominently on advertising. It gave them a strong promotional peg and builders immediately hung their hopes on it.

The strategy worked. Despite wet weather in almost all sections of the country, model homes again became the center of interest for families. And the last two weeks of April and these first weeks of May have seen model-house traffic rapidly grow in most of the 25 metropolitan areas checked by ENR correspondents.

Builders, on the basis of turnout and more importantly on the basis of contracts, raised their production schedules within the last three to five weeks. Boosted production estimates ranged from 10% and 25% in most of the cities to 60% for one builder in Milwaukee.

• Slow first quarter—The optimism is firmly based, so the current gradual increase in sales and starts is expected to build to an impressive finish by the end of the year. There is no denying that starts during the first three months were down from the same period of 1957. But this was not a sharp drop. Although it will act as a drag on the year's total, it will not be severe enough to prevent production this year from topping that of 1957 when the total was 992,800.

The builders are finding out what bankers and statisticians have been reporting regularly: There is no shortage of cash among individuals. The current firm and definite opposition of lending institutions to no-down-payment housing will be no deterrent to sales. And even that attitude by banks may change before the year is ended. The flood of applications to VA offices across the country—100%; 200%; 300% and greater increase—will build an overwhelming demand that the institutions will not readily ignore. And the expected continued downward drift in conventional mortgage rates will make the 4.75% guaranteed VA loan mighty attractive to lending sources.

With one exception (Los Angeles) conventional loans are now at 5½% and 5¼%, and 5% is quite common. Boston is the more rare exception where 4.75% was reported as "common" and a 4½% conventional mortgage loan "not uncommon."

• Low-price home—The sizable shift to the $13,500-and-under market undoubtedly will give impetus to a big return in VA lending, for the cash guarantee that such a loan offers and combined with a slide in the conventional loan interest rate structure, will make the VA loan an attractive investment. The effect of improved VA terms is expected to be felt in August or more certainly by September.

Homes financed through FHA also are now a big drawing card and will continue to become more popular as an investment outlet.

In some areas it is difficult—if not impossible—to produce a house to sell at $13,500 or less. However, in such metropolitan areas builders are making the attempt to hit $15,000 where be-

fore they had been concentrating on $16,000-or-$17,000 structures.

The drop in price from a previous $15,000 to a $13,500 bracket is being accomplished primarily by eliminating built-in kitchen equipment, using less fancy hardware throughout, cutting the interior square footage and—where possible—making use of less expensive land. The later expediency is the exception, because land in most areas is rising in price, a problem that builders are having difficulty solving.

One technological change was reported from Cleveland. Siegler and Sons, who last year built 200 houses, said that they will go to an "economy home," and to cut costs they are switching from red cedar siding to a lower-cost aluminum siding. In addition, the company has a window that it believes is easier to install and cheaper to buy. This company's production for 1958 is expected to be 250 units.

Other builders are switching from brick construction to frame construction or omitting recessed lighting and intercommunication systems. But in many cases, the builders are making built-in kitchen equipment, garbage disposal units, and intercommunication systems extra-cost, optional features.

• **Another strong market**—In almost all cases, builders reported that the $20,000-and-over house is a pretty good sale item and the higher a builder goes on the price scale the easier it is to sell the product. However, this luxury market is a specialized one that generally has remained constant.

The optimistic outlook of many builders is given substance by the method of operation they have adopted: Selling from the model house.

Talk About Housing—City by City

Los Angeles: Individual housing units are down. Apartment building is in a boom, and of big enough proportion to bring this warning from the building and contractors association. "Vacancy rate in multiples is up substantially. . . . And builders in this market are urged to study changing factors carefully before investing."

Miami: The last few weeks saw a jump in sales activity but J. I. Kislak of Kislak Mortgage Co. of Florida said, "It's too early to judge the affects of the new housing bill, but it has encouraged and prodded builders into planning construction."

Milwaukee: Starts are trailing 1957 by about 10% but builders are reporting, "the best March in nine years," and "My business has doubled this year over last year." Most builders have upped building schedules in the last three to four weeks.

New York-Long Island: Long Island has seen a drop in starts but in the last three weeks builders have raised their building plans by 25%. Long Island Home Builders Institute spokesman said, "Model homes are jammed with people and not just lookers. Sales curve climbed sharply in the last two weeks."

Omaha: Through April, starts were up more than 35% with the big demand in $13,000 to $15,000 market. One builder who was operating in the $15,000 to $20,000 class shifted down because the "middle market is a dead one."

Philadelphia: Sales have picked up briskly in recent weeks. "The people are getting over their recession jitters," according to one builder, and recent sales and starts appear to support the belief.

Little Rock: Starts are up 25% and the total for 1958 is expected to better last year by 10%. Mortgage money is plentiful but according to one builder, "The lenders still can call the turn and do."

San Francisco: Area builders are preparing for a new building spurt and will hit hard at the $13,500 market. "With money now available we will do well," said one.

Seattle: Starts are down less than 10% and builders report a strong trend to a two-bedroom house instead of three, with $15,000 or under a good market.

Topeka: A slow, mixed market. Top officer of a lending institution said, "One builder is selling in the $17,000 to $20,000 bracket as fast as he completes them, while the $14,000 to $15,000 tracts are bogged down."

Atlanta: "No real move upward in sales or new starts will be seen here before fall," according to an authoritative trade source.

Baltimore: A spokesman for a major mortgage banking firm said, "There is no indication of a recent upward surge in sales or starts."

Boston: A long hard winter was blamed for a poor January-February showing with one building authority commenting, "As soon as the sun comes out we will have a spectacular buying season."

Buffalo: Sales are off here, but builders echo the refrain of one who said, "I won't cut prices. I'm taking a chance that this situation will blow over before year-end."

Chicago: "We'll be ahead of last year by 10%." A spokesman for the area's homebuilders association who said this added "if we get any kind of break." Optimism is high.

Cincinnati: Market is down slightly and remaining slow because "the buyers are sitting on the sidelines waiting for prices to come down, but they are wrong. Prices may go up 5% or 8% before the end of this year."

Cleveland: Sales are off, starts are off and the future is uncertain. "A good lunch or bad lunch will make the difference between an optimistic or a pessimistic forecast," said the builders' organization spokesman.

Dallas: Definitely a bright spot in the nation. An officer of Southern Trust and Mortgage Co. said, "We don't believe we will see builders jump off the deep end. They will consider sales and work on a week-to-week basis."

Denver: Two strong trends here: a shift to $13,500 and under housing and an upsurge in luxury type apartment buildings. Said one builder, "Denver is ripe for an era of luxury apartments."

Detroit: Hard-hit by unemployment and with negotiations between unions and car manufacturers approaching a climax, the situation here was summed up with, "selling a house now is like trying to sell ice to an Eskimo."

Hartford: After coming almost to a standstill during the first three months, home construction picked up sharply in April and early May. And the builders' spokesman said, "People have the money but there has been a bad psychological effect from recession talk."

Just as durable goods manufacturers, homebuilders were caught in an inventory trap in 1956 and 1957. Houses were started on speculation in the certainty that they would be sold. But the market had turned against them and many found themselves with a supply of completed, but unsold structures on their hands.

That inventory now has been worked off during a year of sharply declining housing starts. The builders caught before are not intending to be ensnared in an inventory morass again. They build one house or a small selection of styles and sizes available and from these write their sales contracts. Then, with completed orders in hand, the builder makes his starts.

The practice makes them contract builders, instead of speculative builders.

• **Lesson learned**—Dallas area builders, who offered a classic example of inventory building two years ago, have definitely turned to the model house operation. Their inventory is gone. So this area, which now is one of the brightest starts-and-sales areas in the nation, is not in the position of counting sale contracts before they are signed. Their reported starts are actually sales, and they anticipate a 16% improvement this year over last.

At the opposite end of the scale is Detroit. Severely hurt by unemployment and short workweeks (coupled with car manufacturer-labor union contract negotiations close to a May 29 deadline) housing is depressed. People are looking, but there the action stops. Labor peace and an upturn in car sales, obviously are the antidotes for a dreary Detroit homebuilding market.

• **The hard-sell**—But whether in Detroit or in Dallas, in a good market or a bad market, a product must be sold today. The potential buyer must first be brought to the product, and to do it a seller must "sound off." Builders are doing just that.

"Buy Now," "Parades of Homes," and "Open House" are screamed forth in the pages of local newspapers, on the radio and on television. Then the hard-sell starts. Builders in several cities offer cash in the bank, gift certificates, a contribution toward the purchase of window draperies or furniture, free built-in kitchen equipment, or a car in the garage.

But the builders also are offering more low-cost structures.

The point that puts over the sale—the purchase bonus offer for a lower-cost product—perhaps is undetermined. The fact is, however, that there is still a strong desire for home ownership, which within a short period of time again is reasserting itself.

TUSCARORA INDIAN RESISTANCE to progress notwithstanding . . .

Niagara Moves Ahead

Two awards totaling $97.9 million are announced

A joint venture headed by Peter Kiewit Sons' Co. received a $31.9 million award for the open canal and pumped storage reservoir of the Niagara Power Project last Thursday, while this week Merritt-Chapman & Scott Corp. was low bidder at $66 million on the first section of covered conduit.

Despite continued reluctance of Tuscarora Indians to see the project's pumped storage reservoir flood part of their reservation (see photo) another section of waterway was to be bid this week, and call next week is set for the last stretch of covered conduit which leads to the pumped storage powerhouse.

The powerhouse will be the last major construction to be advertised.

The Kiewit joint venture, named Channel Constructors, includes Morrison-Knudsen, Perini and Walsh. The contract encompasses excavation of the open canal leading to the main powerhouse, production of concrete aggregate for other contractors, use and construction of the pumped storage reservoir. Major bid quantities are 10.4 million tons of aggregate, 9.5 million cu yd of unclassified excavation (mostly rock) and 7.8 million cu yd of unclassified fill for reservoir embankments.

Merritt-Chapman, now at work on the $98 million main powerhouse, came in ahead of three joint ventures on the first section of cut-and-cover concrete conduits, which includes the intake above the falls. Losing sponsors and bids were the Arundel Corp. at $72.5 million, S. A. Healy Co. at $75.9 million and Walsh Construction Co. at $87.7 million.

Major bid quantities are 7.35 million cu yd of unclassified excavation (mainly rock), 375,000 lin ft of drill holes, 673,000 cu yd of concrete and 37,750 tons of reinforcing.

St. Lawrence Blues

Contractors lose on power project claims—Seaway claims revealed

The unofficial estimate that contractor claims on the St. Lawrence Seaway and Power Project might total $40 million (ENR June 13, 1957, p. 192) was not far wrong.

The dollar values of St. Lawrence project claims became known last week as the Power Authority of the State of New York announced it had negotiated settlements and as the St. Lawrence Seaway Development Corp. got a ruling on how claims against it will have to be paid if any come through with favorable Court of Claims judgments.

On the power work, seven contractor claims on five major contracts totaled $27,625,603. The settlement figure negotiated: $4,859,692.

On the navigation project, the total of claims against the federal government is revealed to be $6,053,290.

The seven contractors involved in the power project settlement are: Walsh Construction Co.; Perini Corp. (formerly B. Perini & Sons Inc.); Morrison-Knudsen Co., Inc.; Utah Construction Co.; Peter Kiewit Sons Co.; Arthur A. Johnson Corp., and Al Johnson Construction Co.

There were five major contracts on which these firms worked in various combinations of joint venture (ENR Nov. 3, 1955, p. 38). Here's how the $27.6 million in claims broke down by contract:

- On the $25.8 million Long Sault Dam—a $10.3 million claim.
- On the $35.8 million St. Lawrence power dam—a $2.6 million claim.
- On the $13.8 million Iroquois Dam—a $5.8 million claim.
- On the $7.8 million Massena intake—a $6.5 million claim.
- On the $5.9 million Galop Island channelization—a $2.3 million claim.

Total claims—$27.6 million—may be compared to the $335 million total estimated cost of the power project.

The contractor with the big claim on Seaway canal excavation is the Peter Kiewit-Morrison-Knudsen combine, now seeking $5.4 million more on a $6.4 million contract. Excavation claims are based on an allegation that the material moved was denser than indicated.

According to the General Accounting Office, any judgment against the Seaway corporation should, "at least ultimately, be paid from funds of the corporation. . . . We will consider recommending to the Congress the enactment of appropriate legislation."

No contractor claims have reached the Court of Claims as yet.

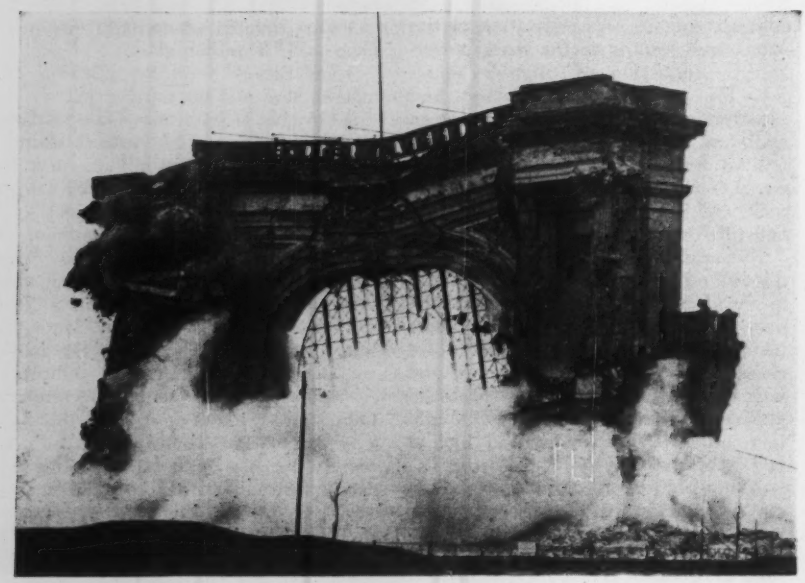
Huge Skyscraper Will Straddle Railroad

A 50 story office building is planned for erection alongside Grand Central Terminal in New York City. To be known as "Grand Central City," it will contain more than 3 million sq ft of air-conditioned floor space. Estimated cost is $100 million.

The New York Central and New Haven Railroads have agreed to lease the site to Erwin S. Wolfson, chairman of the board of Diesel Construction Co., and real-estate men, Herbert Scheftel, Stuart Scheftel and Alfred G. Burger—all of New York City. The lease, which has not yet been signed, extends for 80 years, including renewals, and involves an aggregate rental income of about $100 million. Construction financing is still to be arranged.

Floor area provided in the proposed office building will be exceeded only by that in the Pentagon, with 6.5 million sq ft, and the Merchandise Mart, Chicago, with 4 million sq ft. The 3 million sq ft of floor area is equivalent to nearly 15% of all office space added in New York City since 1947.

The 6 story Grand Central Terminal Office Building, which now straddles the tracks, will be demolished. The new structure will be erected by Diesel Construction Co. Emery Roth & Sons is the architect.



Wrecking Crew Takes Over Where Bomber Crew Left Off

A monumental facade disintegrates in a cloud of dust as demolition charges go off in West Berlin's Lehrter Railway station. Allied airmen damaged the station in bombing raids during World War II, and wrecking crews now at work will finish taking the edifice down by the end of this year.

Fence Deflects Jet Blast

Precast concrete blast screens may soon protect travelers on roads near airports from propeller and jet blast of modern, high-powered aircraft. With planes here parked with jet engines only 60 ft from the screen, no serious blast effect reaches the road. All the blast is said to be directed upward by the leaning wall. Such concrete walls have been tested as permanent fixtures to replace the portable steel screens used by British Overseas Airways Corp. Maintenance costs on the new concrete designs are expected to be negligible.

$12 Million Flood Hits Southwest

Washed out bridge on the Red River in Louisiana, indicates the destructive force of rampaging flood waters that struck the Southwest last week. Persistent rains (7 to 14 in.) plagued the Texas, Arkansas, Mississippi and Louisiana areas causing more than $11.7 million damage, more than half in the Trinity Basin in Texas. Some $25.9 million damage was prevented by the Corps of Engineers flood control structures. Meanwhile, early this week, the Ohio River was still rising above flood stage, but was expected to crest before serious damage occurred.

Fast Work at High Earthfill Dam

Swift Dam, a hydroelectric power project of Pacific Power & Light Co. on the Lewis River near Cougar, Wash., now has more than 10 million of a total 15.3 million cu yd of fill in place. When finished the dam's 2,100-ft-long crest will be 512 ft above low point in the cutoff trench. Its height will be exceeded only by Trinity Dam in California, to be 537 ft high.

Clean Streams Compromise Indicated

Industries and interstate agency appear to move closer to accord: Chloride controls without limits

New hope for a still cleaner Ohio River shined forth this week. The Ohio River Valley Water Sanitation Commission is soliciting comment from affected industries on a new and simplified plan to control salt discharge to the Ohio. Recommended by a special ad hoc committee charged with reviewing the controversial Orsanco staff plan (ENR July 18, 1957, p. 30), the new proposal simply calls for dischargers of "significant" amounts of chloride to build at-plant impoundments sized to store salt wastes for at least three months. This would enable discharge to be proportioned to stream flow so that concentration of this non-decomposable pollutant could be maintained at uniformly low levels.

The new plan meets the main criticism leveled at the Orsanco staff plan by the chemical industry. Indeed, the proposal is nearly identical to one made earlier by the biggest salt discharger in the Ohio Basin, Columbia-Southern Chemical Co., except the latter assumed a limiting chloride value to be met. Final commission action is expected at a scheduled September 12 meeting. Orsanco heard the ad hoc committee's report at its recent quarterly meeting in Hardin, Ky., and there authorized its distribution for comment.

• **Objections to staff plan**—The original staff proposal set a maximum monthly chloride concentration in the mainstem Ohio of 125 ppm and apportioned the allowable salt load from tributaries (where most of the salt dischargers are located) in proportion to the dilution capacity furnished by the tributary.

Chemical industry representatives to Orsanco objected strenuously to the 125 ppm limit on the grounds that the U. S. Public Health Service standard for drinking water is 250 ppm and that negligible data are available to justify a lower limit being set for economic reasons (primarily the corrosion effect of salt in cooling water).

Chemical processors just as vigorously opposed the proportionate discharge theory because it ignores the unequal distribution of salt desposits and other natural resources among the tributary basins and the consequent concentration of salt-using plants where the salt is. Once a tributary's allowable salt discharge loading is reached, plants there might have to cut back production while new chloride dischargers could build elsewhere in the basin.

Industry's objections indicated that it considers the cost of lagoons required to hold back chloride discharge until periods of greater river flow to be a minor factor compared to the ultimate curtailment of plant production due to an unrealistically low salt limit and an inequitable control concept (which might very well be established on other river basins and for other pollutants).

• **Objections heeded**—The Orsanco committee's proposal contains no limits or control formulas. State pollution control agencies, with concurrence of Orsanco, would determine storage capacity of lagoons (or approve in-process changes to reduce chloride wastes) required by the larger salt contributors to meet the three month specification. The states and Orsanco also would formulate actual discharge schedules, to match salt load with river flow.

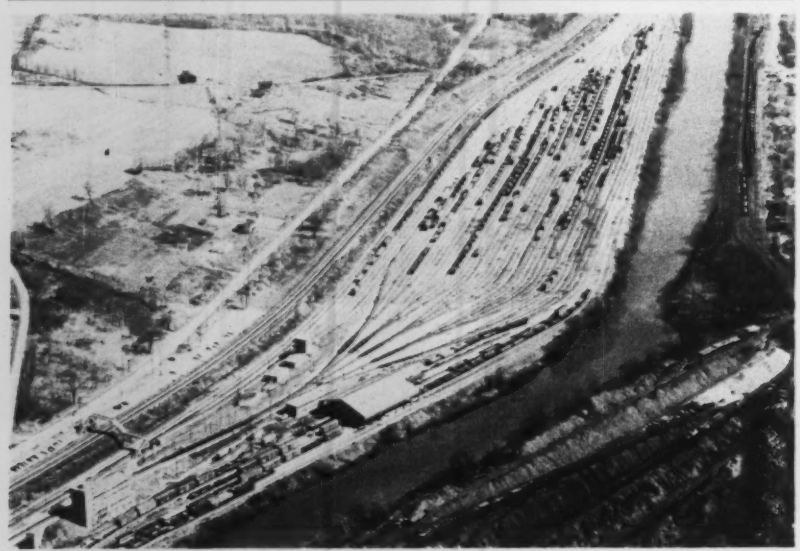
If the lagoons were built in the next couple of years, as is proposed, maximum concentrations of salt in the Ohio would immediately be reduced fare below any figure contemplated in the original staff plan. This is a toothsome prospect for regulatory officials, who so often see maximum ppm limits quickly become the norm.

With the lagoons synchronizing salt discharge to river flow, the Ohio River can handle seven times the present total chloride load before reaching monthly average concentrations of 125 ppm.

Support of the new proposal was voiced by Edward J. Cleary, executive director and chief engineer of Orsanco and chief conceiver of the discarded staff plan.

Mr. Cleary plunged into new endeavors by proposing at the Hardin meeting an Orsanco patrol system to spot-check obvious sources of offense. He said that as it began its 11th year, Orsanco was in a position to undertake some river surveillance. It would be aimed chiefly at reducing the number of careless spills of oils and other discharges containing color and floating materials.

Much of Mr. Cleary's report to the commission was devoted to proving that water quality conditions in the Ohio were improved over those of 10 years ago when the eight-state crusade to clean up the river began. The reassur-



Freight Train Yard Is Electronic Machine

Another step in the railroads' drive to modernize is just-dedicated Gateway Yard, a $7.5 million electronic freight yard to serve the Pittsburgh-Youngstown district. The 210 acre facility makes possible to cut train classification and handling time in half through use of giant electronic computers, pushbutton switching machines, closed-circuit television and radar.

The yard, with its 73 miles of track having a total capacity of 5,858 cars, is the third such one to be dedicated on the New York Central System within the last 14 months. The three represent a total investment of $32 million.

ance obviously was designed for public consumption to counter recent headlines in Cincinnati newspapers proclaiming that the Ohio River was getting worse. A Cincinnati newspaperman had drawn conclusions from remarks attributed to a high USPHS official in Washington.

Extension of Florida Pike Opposed by Toll Authority

Acting on the report of Coverdale and Colpitts, New York City engineers who recently completed a traffic and earnings survey, the Florida State Turnpike Authority has recommeded against a proposed $70 million extension of the Miami-Ft. Pierce Turnpike to Orlando at the present time.

While the 1957 state legislature had approved extension to Jacksonville at an estimated $185 million, the decision of the Turnpike Authority was to build one section at a time.

Governor LeRoy Collins, who has been a strong advocate of the turnpike extension, said in Tallahassee: "In view of the Coverdale and Colpitts report, the present outlook is dismal, but the situation should be reviewed two years from now."

Helping to stir opposition among the Florida citizens against the turnpike extension, is the 1,164 mile interstate program scheduled for Florida. While only 87 miles of this program has been completed or put under contract, plans or surveys have been prepared for other sections totaling nearly $400 million. Governor Collins said, "While progress has been slow in Florida on interstate routes, the state has not been dragging its feet." He pointed out that precedence is being given to expressways in the larger cities.

Plan Proposes $83 Million Area Sanitary Extensions

An engineering survey has recommended expansion of water supply and sewage facilities totaling $83 million by 1975 for the Toledo, Ohio, metropolitan area. The survey, stemming from disagreements between the city of Toledo and surrounding Lucas County over who should be extending water mains and sewers into the county areas, shows it would be most economical for the city to continue supplying water and treating sewage in the suburbs.

Expected in-city water expansion would cost $11.6 million while sewer costs would be $5.8 million. Extension of water and sewage lines into the county and expansion of city water and sewage treatment plants to meet added county demand would cost $12.1 million for water and $53 million for sewage. Report was by Finkbeiner, Pettis & Strout, Toledo consultants.

Waste Problem Can Be Licked

Pennsylvania reports notable success in controlling mine acid waste; chemical inhibitors eschewed

Growth of the total mine acid load in Pennsylvania streams has been arrested for the state as a whole and reversed in a number of watercourses.

This was the encouraging report that Pennsylvania presented to officials of neighboring states at the spring meeting of the Interstate Commission on the Potomac River Basin near Bedford, Pa., last week. Through cooperative effort with coal operators, the mine drainage section of the Pennsylvania Health Department has had notable success in reducing the flow of acid effluent from both strip and deep mines into the state's streams.

Enforcement powers delegated to the state Sanitary Water Board by Pennsylvania's clean streams law of 1945 play an important part in this success. The powers are used sparingly; patience and persuasion have been the main tools of the board and state officials in obtaining 93% compliance with board orders on close to 10,000 active mining operations under way or applied for since 1945.

These orders include such directives as the experimental rules and regulations for operation and maintenance of strip mines, worked up by the state's mine drainage experts and adopted by the Sanitary Water Board in 1950. Two years later the board adopted clarifying amendments to make the regulations even more effective.

Though rarely used, the enforcement authority has greatly simplified and speeded mine-owner cooperation with the mine drainage section of the Health Department. And with the state Department of Mines and Mineral Industries. L. S. Morgan, chief of the drainage section, explained to officials of Potomac Basin states how this cooperation has paid off.

Pennsylvania's program so far, he made clear, has been based entirely on control of the physical features and methods of operation in active coal pits. Its objectives are to: (1) Keep water out of the pits and (2) control the drainage that flows out of mines despite feasible measures that may be taken to prevent the entry of moisture.

• **Inhibitors nixed**—Chemical inhibitors play no part in the present program. Further, they have no foreseeable place in the future of acid mine waste control, research people who are most familiar with the problem told the assembled state officials. Three experts from the Mellon Institute of Industrial Research in Pittsburgh and the Pittsburgh Consolidated Coal Co. agreed in that verdict.

With the tremendous increase in strip mining during the last 30 or 40 years, Pennsylvania has put a major effort into control of these operations.

• **Control methods**—Here are some of the effective methods practiced in the state, as noted by Mr. Morgan: (1) Use surface water diversion ditches to keep water out of strip mines; (2) collect groundwater and channel it by conduits through backfilled strip areas; (3) don't strip across stream channels, thus leaving stream banks intact to protect natural channels in strip mine areas by hedge-hopping streams; (4) control seepage from strip operations by leaving overburden undisturbed at the outcrop of the coal; (5) backfill strip pits promptly to reduce the time sulfuritic material is exposed to air and moisture; (6) prevent seepage into sulfuritic material by segregating gob, or coal-bearing waste, in backfill and sealing it off with impervious cover.

Similar methods are used to control and reduce acid mine waste discharge from deep mines, Mr. Morgan added. Air sealing of underground mines is not 100% effective, he noted, but filling of holes and crevices can prevent or reduce the flow of water into a mine. Residual effect of the WPA sealing program on abandoned mines in the 1930s is still noticeable in Pennsylvania, he said.

Another significant proposal, not much practiced yet, would greatly diminish the acid load on streams, Mr. Morgan said. This idea calls for spreading the pumping from deep mines over a longer period than is now used and thus reduce the amount of acid entering the streams during a pumping hour. Safety requires high-capacity pumping of active mines at certain hours, he noted. Also, mine owners would have to pay more for electric power during the day than at off-peak hours. But, he added, if the present 12 hour discharge into streams of the Ohio River Basin could be spread over 24 hours, there would be no acid condition in the Ohio River below Pittsburgh.

Pennsylvania's success in control of acid mine wastes has led the Ohio River Valley Water Sanitation Commission to consider a test of similar measures in other states of the basin. The commission has created a three-state subcommittee including representatives from the states of Indiana, Ohio and Pennsylvania to explore the possibility.

Consultant Group Sets Goals

Rapidly developing prestige in spite of being a relatively new organization, the Consulting Engineers Council held its second annual meeting in San Francisco early in May. Growth of the organization—and the problems surrounding growth—took much of the time of the delegates from 21 associations of consulting engineers.

Problems of ethics were discussed. One result was initiation of a study to develop a simple, straightforward code of ethics that will be much more easily understood and enforced than existing codes.

The group also adopted a recommended procedure to be followed by consulting engineers receiving requests for quotations for services. It is suggested that the members refuse to submit a fee where services are solicited by mail or in any case where the engineer has reason to believe that other engineers are being asked to submit a quotation for the same service. Replies to such solicitations are to be limited to listing technical qualifications and availability.

A study was also initiated covering such things as free engineering, package deal engineering and construction, and engineering by contractors. Aim of the organization is to attack the problem in its over-all aspect rather than simply trying to pinpoint individual cases.

The group gave serious consideration to moving its headquarters from Springfield, Ill., to Washington, D. C. —which is an indication of growth of the council and direction it may be heading. But it was decided available funds would not permit such a move at this time. However, money was allocated for establishment of a one-man liaison office in Washington with the individual yet to be selected.

Direction that the organization is taking was shown in a seven point program outlined by its new president, Chas. C. Pate, consulting civil engineer of Tulsa, Okla. Mr. Pate asked the membership to accomplish the following: (1) resolve organizational problems; (2) broaden communications; (3) broaden member participation; (4) resolve or combat the problem of free engineering; (5) establish on the national level more realistic fees and responsibilities for consulting engineers; (6) establish broader recognition of the consultant's part in the building industry; and (7) develop a reasonable code of professional ethics.

Two new associations were added to the council making 21 in all. The new groups are the Consulting Engineers Association of Michigan and the Houston Chapter of the Texas Association of Consulting Engineers.

In addition to Mr. Pate, other new officers include: first vice president—L. K. Crawford, civil engineer of Springfield, Ill.; second vice president—Ralph M. Wescott, mechanical engineer of Los Angeles; secretary—Hueston M. Smith, industrial engineer of St. Louis; and treasurer—B. M. Dornblatt, civil engineer of New Orleans, La. These men plus outgoing president Edward J. Wolff, electrical engineer of Chicago, comprise the executive board.

Partnership Project

Irrigation-power group awards design contract for $50 million job

Bechtel Corp., San Francisco, has been awarded a contract for design and supervision of construction of a local partnership-type $50 million power and irrigation project on South Fork of California's Feather River.

The project, an undertaking of the Oroville-Wayandotte Irrigation District, involves the same type of partnership with a power company that two other California irrigation districts used successfully in the $52 million Tri Dam Project (ENR Aug. 16, 1956, p. 40).

The Oroville-Wayandotte District will make the water project pay its own way by erecting three powerhouses (total dependable peak capacity 85,000 kw). Under terms of an agreement still to be signed, Pacific Gas & Electric Co. will operate and maintain the powerhouses, paying the district $2.5 million a year.

This idea is somewhat different from the Tri Dam Project, where the districts operate the power plants and sell the power to PG&E.

The agreement with PG&E will make the district's bond issue look better to investors, as the guaranteed annual payments will act as security.

If the district can sell bonds at an interest rate no higher than 3.75%, the PG&E payment is expected to be sufficient to service the bonds, including interest and amortization.

• **Project description**—The district hopes to invite bids on the bonds with construction to start in the fall. Bechtel must disqualify itself from bidding on construction.

Some 92,000 ft. of tunnel 9 to 12 ft in dia will be required, about 42,000 ft of it pressure tunnel, according to Frank Bonner, chief engineer for the district and developer of the basic design.

Three storage dams are planned:

• Grass Valley, 195 ft high, 700 ft long at crest, earth core with rockfill shell, with 91,300 acre-ft storage capacity.

• Slate Creek, 124 ft high, 450 ft long at crest, concrete arch, storage capacity 5,600 acre ft.

• Sly Creek, 245 ft high, 900 ft long at crest, earth core with rock shell, storage 59,000 acre ft.

Four diversion dams will be built—Slate Creek, South Fork, Forbestown and Ponderosa.

Major powerhouses will be Woodleaf, with a 49,000 kw capacity and effective head of 1,430 ft, and Forbestown, 27,000 kw with 828 ft head. A third temporary powerhouse, of 9,000 kw capacity will operate on water not needed for irrigation.

The watershed to be developed is in the Sierra Nevada Range above Oroville in northern part of the state. The highest dam—Grass Valley—will be at an elevation of about 5,000 ft. The watershed gets heavy precipitation, about 70 in. a year.

The project will be upstream from the proposed 700-ft-high Oroville Dam, which will be the feature of the Feather River Project.

Briefs

• **Design contract**—The Pennsylvania Department of Highways has retained Michael Baker, Jr., Inc., of Rochester, Pa., and Berger Associates, Inc., of Harrisburg, to do the preliminary design for a separate section of a 35 mile length of a interstate system highway between Washington and Warrendale. Both firms will be paid 4½% of the estimated construction cost. In the Baker firm's case the estimated cost is $37.5 million and in the Berger firm's case, $33.5 million.

• **Aerial surveyors' code**—A code of ethics developed by the Association of Professional Photogrammetrists as a guide to its members is being distributed this month to state highway department engineers and to consulting highway engineers. So far, 22 of the association's members have subscribed to the stiff code. List of member firms and copies of the code may be obtained from the Association of Professional Photogrammetrists, 224 DuPont Circle Building, Washington 6, D. C.

• **Elliptical terminal**—Under a new $2 million contract, Lehigh Structural Steel Co. will fabricate and erect the steel for Pan American's suspended-roof elliptical terminal at Idlewild Airport in New York. Piling and paving have been under way for some time. General contract bids are due to be opened May 16.

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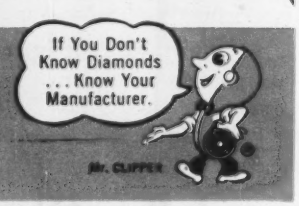
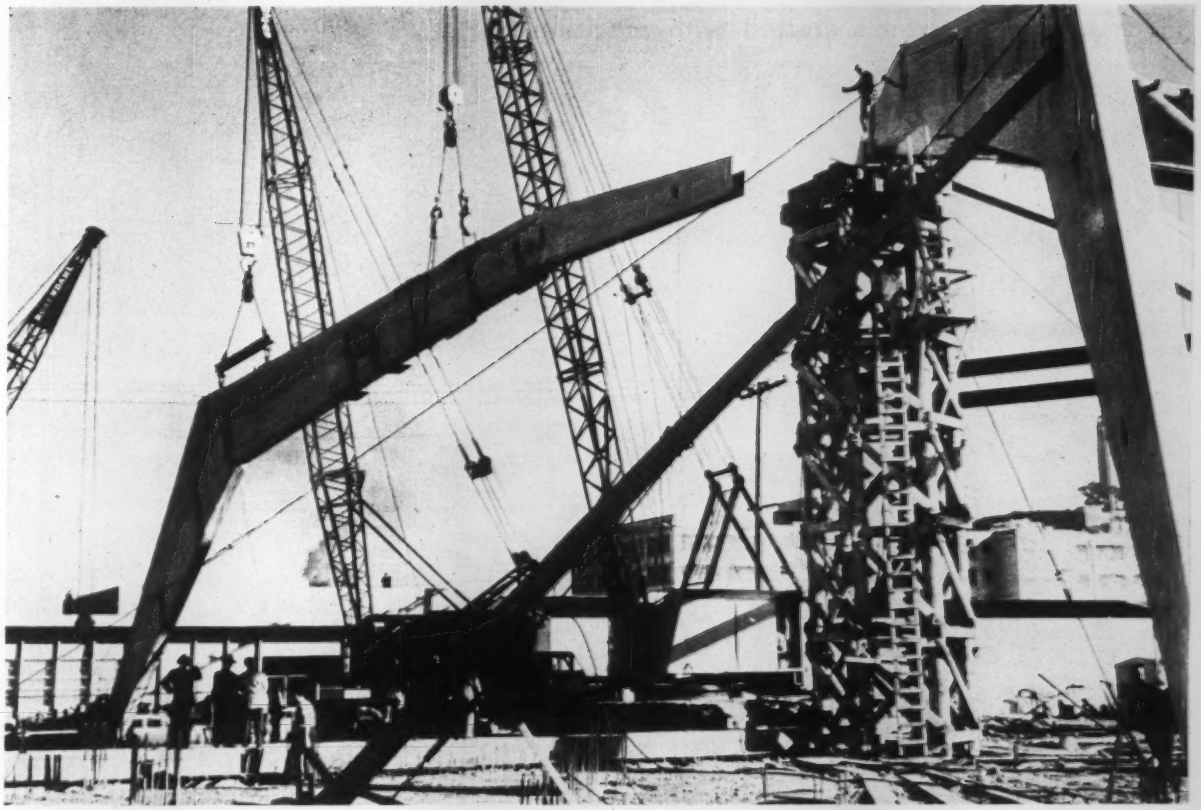




PRECAST RIBS weighing 60 tons were erected by three cranes for San Francisco auditorium with 156 ft dome span.

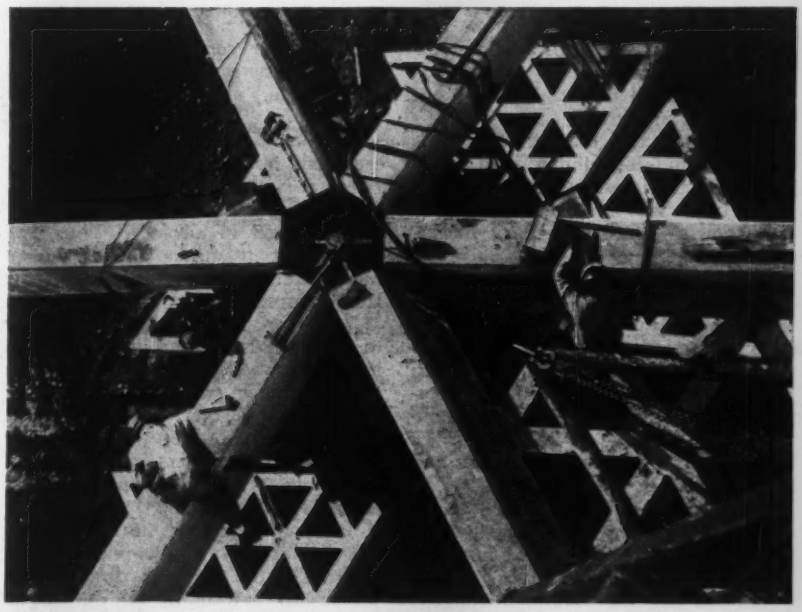
Large Ribbed Concrete Dome Is Precast

Three interlocking three-hinged arches of precast concrete form the ribs for a hexagonal-shaped 156 ft dia dome roof of an auditorium nearing completion on the San Francisco waterfront. Because of the great weight of these members, three cranes were teamed to erect each 60 ton rib half. The roof between the ribs is composed of 12 ton precast triangles, 20 ft on a side.

The design was executed in this spectacular fashion largely for architectural effect. However, the scheme is expected to be less expensive than comparable sized structures of other materials.

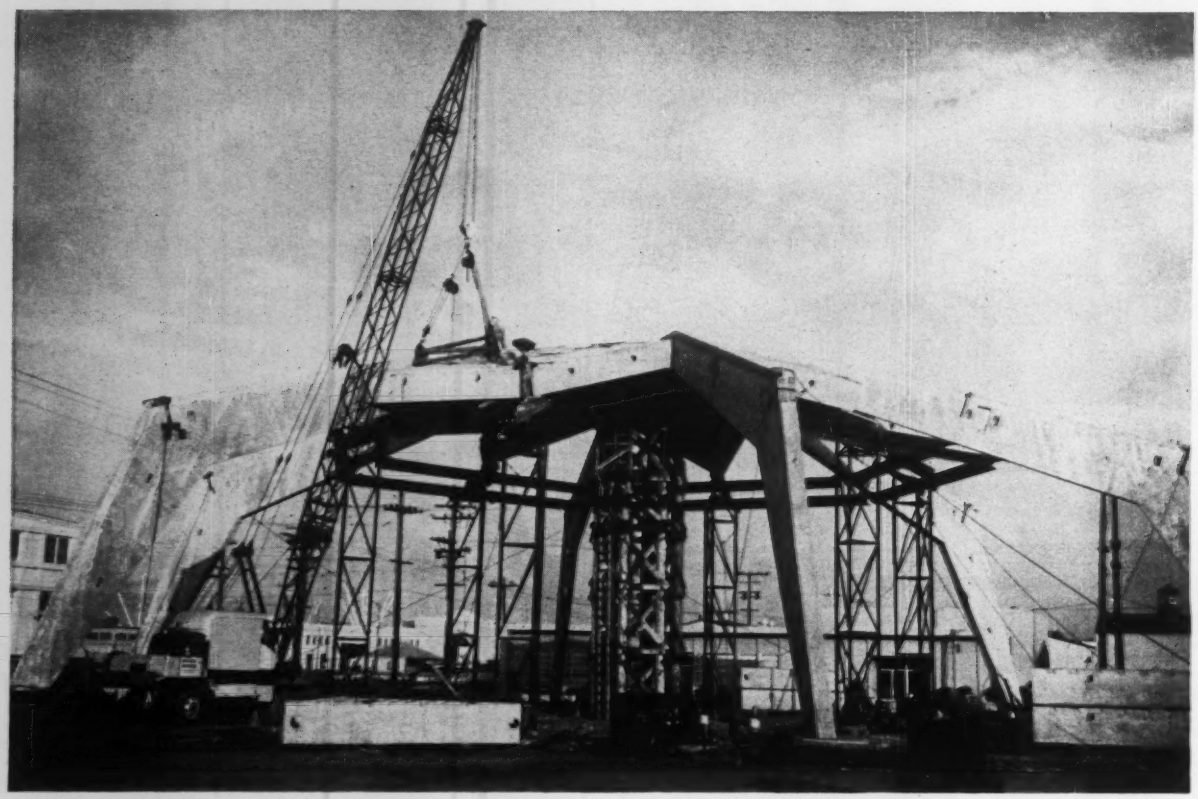
Being built for the S. F. Bay Area Longshoremen's Memorial Association, the building will serve as a union hiring hall and meeting room. Because it is situated near San Francisco's famous Fisherman's Wharf, the longshoremen and their architects wanted an outstanding but economical structure.

Thus, when the triangle-filled ribbed structure was conceived, the architects asked their consulting structural engineer, Isadore Thompson, "Can it be



AT THE CROWN, half ribs are joined to a hexagonal steel shaft. Rib end plates are welded or pinned to opposite sides of the shaft.

. . . Heavy dome panels erected with precision



PRECAST ROOF PANELS, triangular in plan and weighing 12 tons, were set to proper slope between ribs by chain falls on a hoisting frame. Temporary falsework supporting the ribs and panels was removed after completion of the assembly.

done?" They also asked, "Can it be done with some degree of economy?" Thompson's answer to both questions was, "Yes!" So the architect-engineer team went on to develop the plan.

The building is part of a $1 million program to provide a new union headquarters financed by member contributions. The auditorium can seat 2,300 and will be rented out for such functions as would not interfere with union dispatch activities. Layout is such that union traffic will have minimum interference with tourist traffic at Fisherman's Wharf.

• **Welded connections**—The ribs are 18 in. thick and vary in depth from 33 to 93 in. It can be seen that the arches are not minimum size. That's due to the irregular shape dictated by architectural considerations. Maximum reinforcement occuring in the legs is 15 No. 11 bars near the outside face and 8 No. 11 bars near the inside face.

The arches are pin-connected at the crown and are tied across the bottom there with 10 in. wide by 1½ in. thick steel plates. Actually, stubs of the plates are cast into the legs near the bottom and the plates are welded to these stubs after erection. This provides a positive connection between ribs and tie plates. The foot of each rib is placed in a suitable recess in the footing slab.

Extending from each half rib at the crown is a 1½ in. thick plate which is welded to a center hexagonal steel shaft. Alternate ribs are pin-connected with 5¼ in. dia pins to the center connection.

To minimize handling of the ribs, each half rib was cast at a spot near where it would be erected. Erection was handled by three cranes, each precisely located in advance. Thus, the entire erection was handled by booming and turning the cranes without any lateral movement.

A 35 ton truck crane handled the toe of each arch until it was rotated into a near-vertical position at which time this crane was released. Most of the weight, however, was picked by a team composed of a 50 ton truck crane and a 60 ton crawler crane. Each of these cranes worked through a bridle attached at two points.

Temporary support during erection was provided by a timber-pile falsework tower. At the toe, the ribs are supported on footings based on cast-in-place concrete piles.

Once the ribs were in place, a tension of about 50 kips was jacked into 10x1½ in. steel ties connecting the rib bases. As the roof load was added, additional tension was jacked into each tie by a pair of 50 ton jacks. Final dead load thrust of the arch and the roof load in the steel tie is figured at 261.7 kips. After all load was in place, the ties were welded together and sealed below the concrete floor.

• **Precast triangles**—The roof of the auditorium between ribs is composed of precast triangles 20 ft on a side. And, on the under side, each 20 ft section has a ribbed triangular pattern. The six precast triangles in the center consist of an open framework with no top slab and will be covered with a plastic material, to form a skylight.

On erection, the 12 ton triangles are connected to the ribs and to each other by welding pairs of steel plates or angles extending from each side. Many of the 96 units were supported on temporary falsework until the dome was completed. After all precast sections were in place, space between the units was filled with lightweight concrete to form an integral roof structure.

The combination of precast triangles and precast ribs does not actually re-

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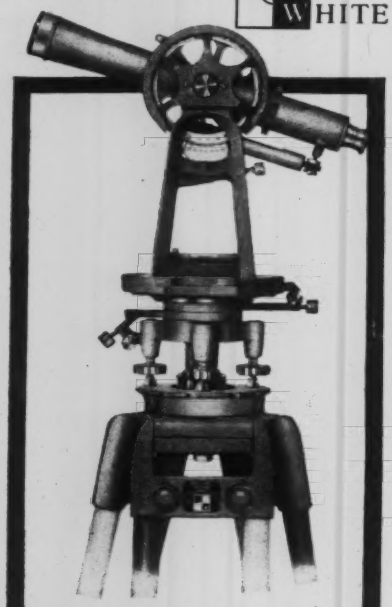

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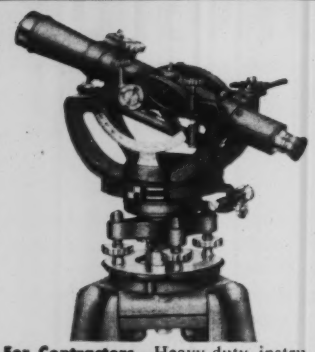

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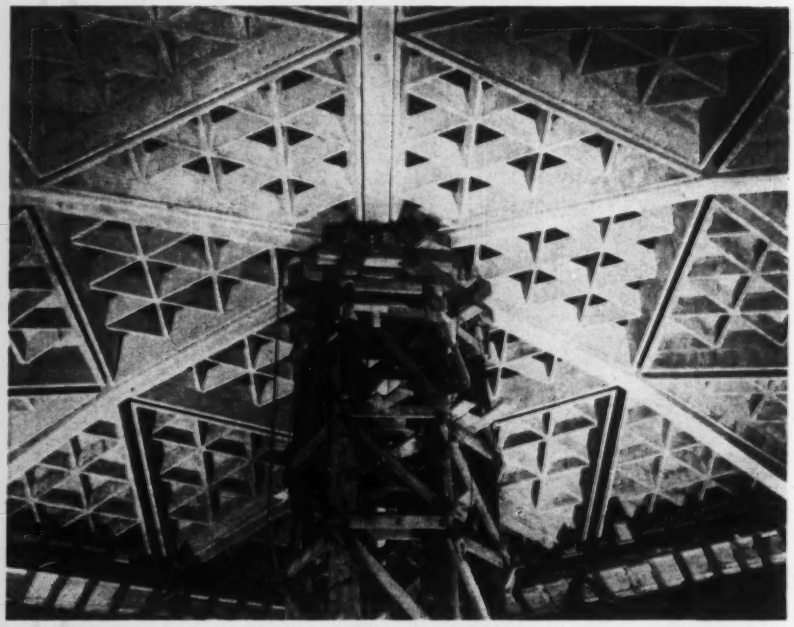
. . . Panel grids decorate precast dome



TRIANGULAR PANELS forming the auditorium roof were supported temporarily by a tower at the crown. Spaces between the panels were filled later with lightweight concrete.

sult in shell action. Rather the triangular units span between ribs by beam action. Concrete fill between critical units is heavily reinforced to form a beam. Depth of the precast units is governed by this beam.

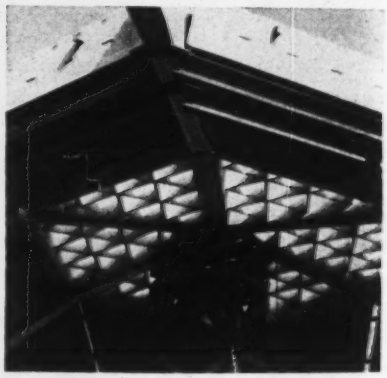
Thus, the concrete triangles are all 3 ft 4 in. deep on the exterior. Interior ribs are 1 ft 8 in. deep. And the top slab is 2½ in. thick. Lightweight concrete with 3,750 psi, 28 day strength is used for all dome members. The lower section of the roof which is actually the upper wall has intermediate concrete columns to reduce the span.

The 96 triangular sections were cast by Ben C. Gerwick, Inc., at its Petaluma, Calif., casting yard and barged to San Francisco.

Maximum size aggregate was ¾ in. The triangles were cast two a day on metal-pan forms and subjected to an overnight steam cure to permit form stripping the following day.

A triangular-shaped picking frame was used to lift the precast units. This frame was equipped with a pair of chain hoists so that the units could be tipped to precise slope before being placed in the dome roof.

Setting the panels by this method not only made erection easier but had other advantages as well. Once the panels had been raised to the roof level, control of movement was in the hands of the crew working directly on the panel. Thus, signaling to the crane operator at ground level was minimized. This in turn reduced the danger of damaging any of the panels during the placing operation. Aligning the welding lugs and maintaining the proper clearance between panels went faster.



OPEN GRID PANELS at the crown formed a skylight, later glazed with plastic.

• **Credits**—Design of the Longshoremens' Auditorium was executed by Henry Hill, architect with John W. Kruse, associate architect. Isadore Thompson was structural engineer.

General contract for the construction of the building is held by Jacks & Irvine, with George Irvine as superintendent. Jack Weiss was in charge of the casting work and Wm. Goss supervised the erection for Ben C. Gerwick, Inc., holder of the subcontract for casting the triangular panels and erecting the ribs and panels.

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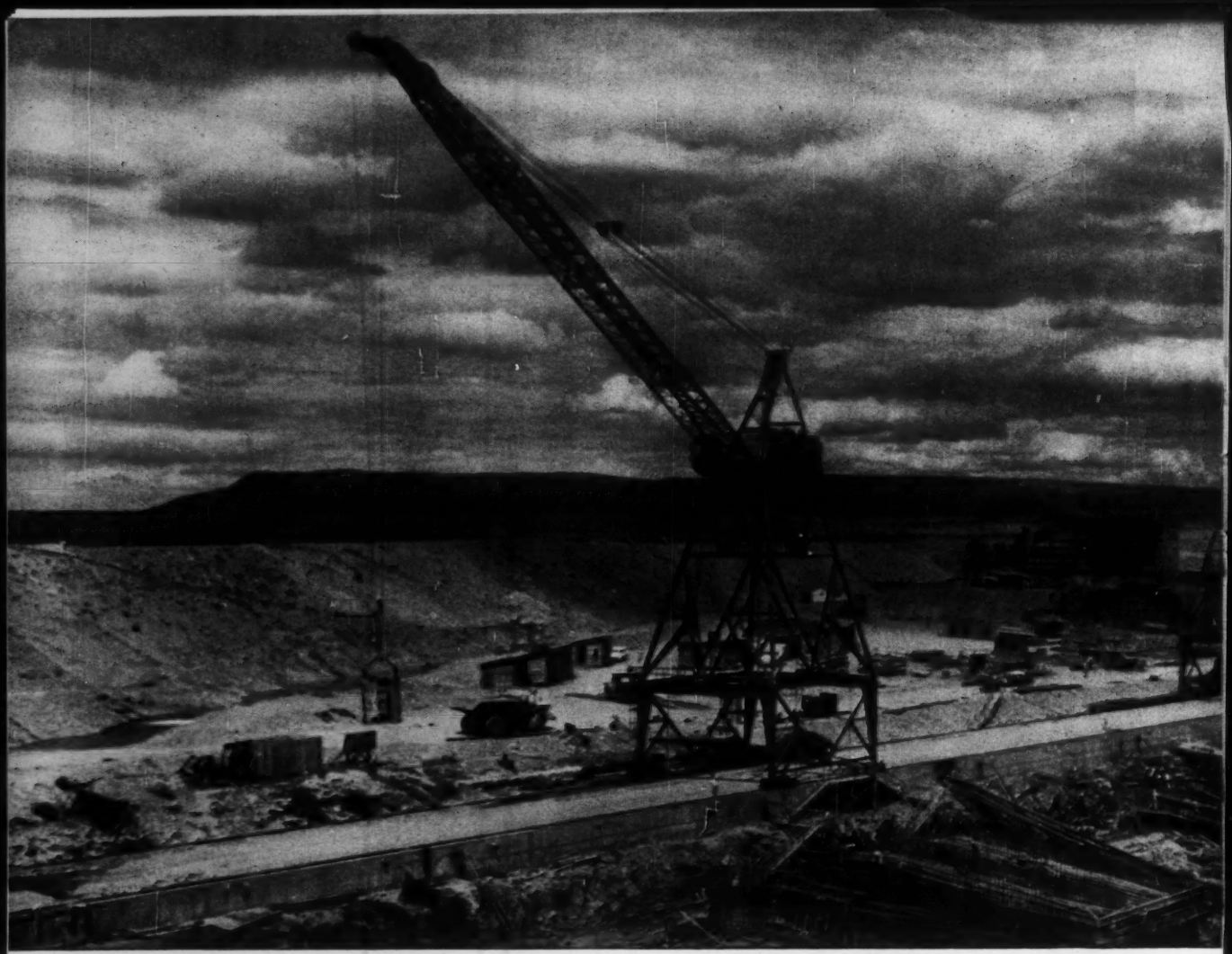

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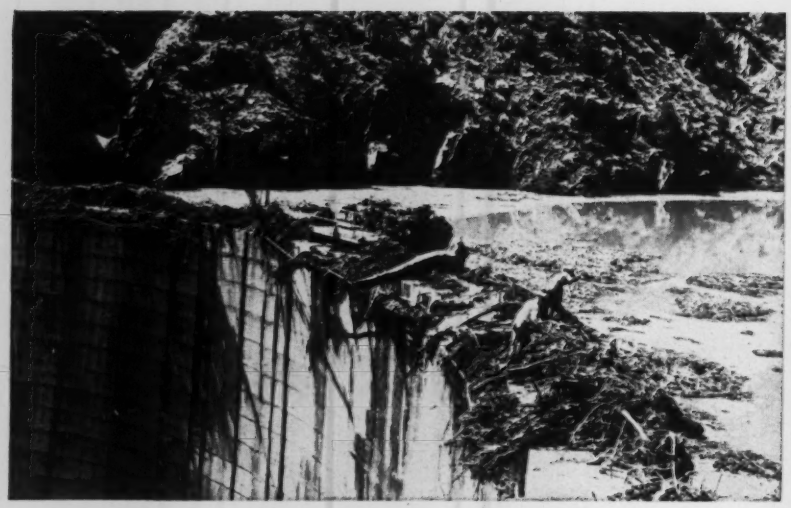
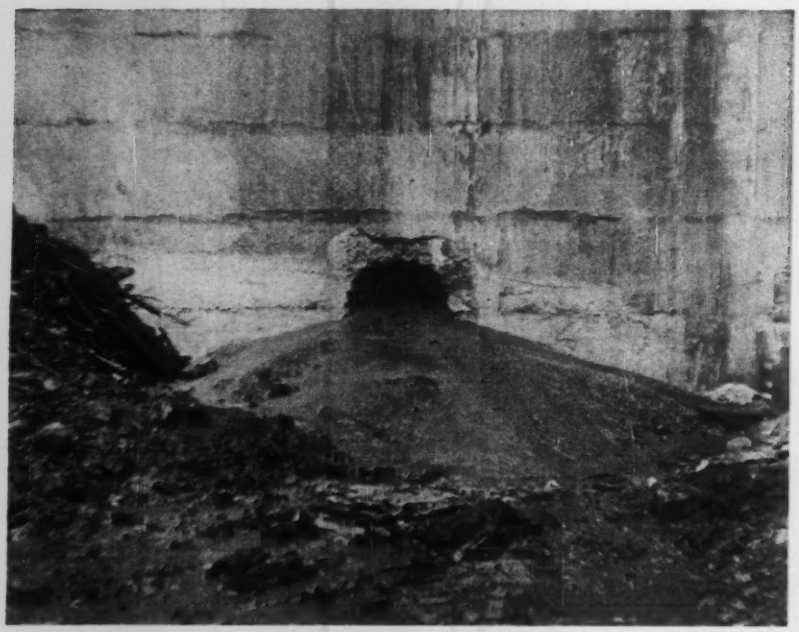


A half hour thunderstorm over a remote desert area in Nevada caused a flash flood that almost completely filled a Navy depot's water storage reservoir with 250,000 cu yd of muck. Getting rid of it, by flushing through a hole blasted in the dam base and hauling over the dam crest, proved to be an extraordinary chore.

RESERVOIR SIDE of 237 ft long arch dam after

Muck-Filled Reservoir Behind 120 Foot



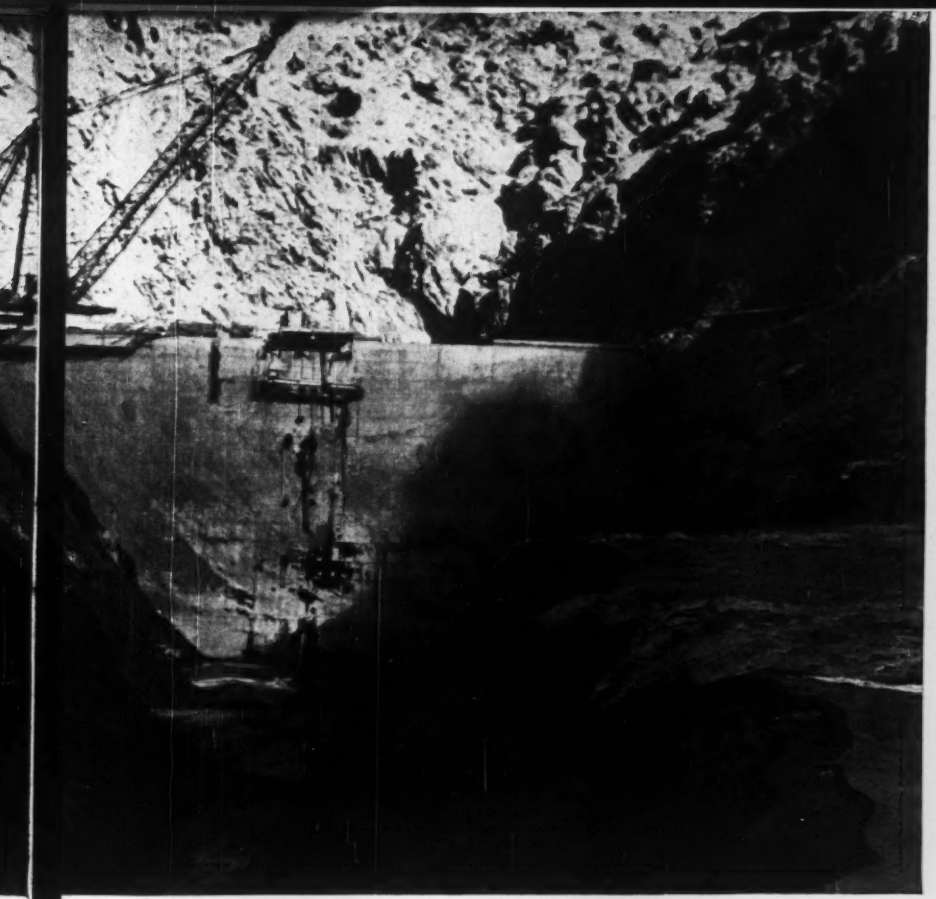
IMMEDIATELY AFTER HOLE WAS OPENED nothing happened, as shown, although 80 ft of silt was over it. But 30 min later 10 million gal of mud and water shot through.

CDR C. F. Mobley, CEC, USN

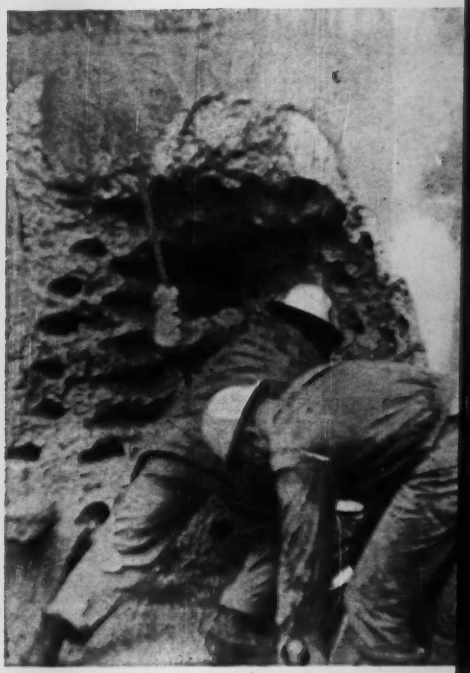
Formerly Resident Officer in Charge of Construction
U. S. Naval Ammunition Depot
Hawthorne, Nevada

The Navy recently put the finishing touch on the challenging restoration of a 120 ft high arch dam whose reservoir was almost completely filled with silt after a devastating flash flood. The final work involved installing a sluice gate in a 4 x 4 ft hole drilled and blasted through the 21 ft thick base of the dam to drain the reservoir of muck.

Cat Creek Dam had been completed by the Bureau of Reclamation for the Navy in 1931 to impound 50 million gal of water supply for the Naval Ammunition Depot at Hawthorne, Nev. On July 21, 1955 a half hour thunderstorm caused a flash flood in Cat Creek so violent it scoured the canyon above the dam clean of overburden, trees, vegetation, water mains and whatnot. The reservoir was left nearly full of silt and debris—and of course non-serviceable as a source of water. It was



about 25% of silt had been removed by stiffleg derrick and by flushing through a . . .



4 FT HOLE blasted in 21 ft dam base.

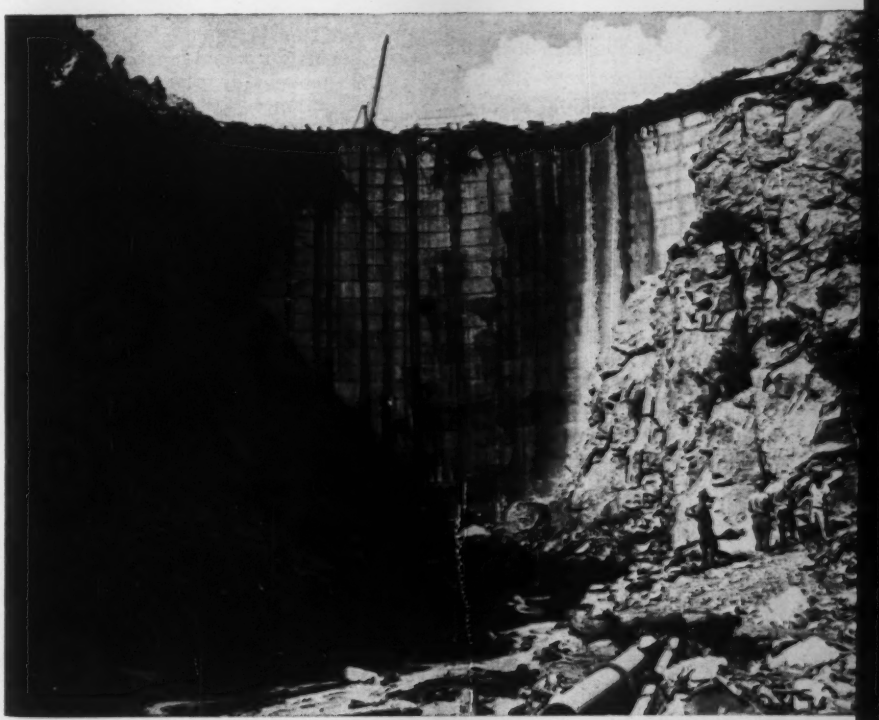
Dam is Cleared

estimated the reservoir contained 250,000 cu yd of muck and some 5,000 cords (23,600 cu yd) of trees.

Utah Construction Co. was awarded a negotiated lump sum contract shortly thereafter to clean out the reservoir. The contractor first proposed to install a diesel powered winch mounted near the dam crest to pull a Sauerman scraper carrying loads of muck through an 8 x 10 ft hole in the dam. Fearing for the integrity of the dam, the Navy disapproved the hole in the dam. Utah then decided to use a Sauerman scraper over the top of the dam, employing cables connected to a sliding block at the upper end of the reservoir.

Unfortunately, the gumbo-like muck would not ramp properly over the dam. The scraper was then employed to bring material to the upstream face of the dam where it was picked up by a stiffleg derrick equipped with 3½ yd clamshell.

• **Difficult terrain**—Actual de-mucking did not start until November due to the extreme difficulty of moving equipment to the reservoir area first up then



STEEP CANYON WALLS below dam, and similar cliffs above the dam, made the restoration project an extraordinarily tough construction job.

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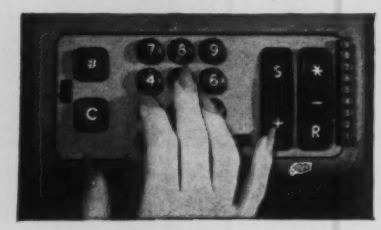


. . . Restoring a muck-filled reservoir

down the canyon walls that are shear in many places. Moreover, working space below the dam was only 80 ft wide (dam crest is only 237 ft long). A rigging superintendent who was a veteran of Hoover Dam was heard to remark, "This is the toughest job I've ever been on!"

The reservoir area was kept relatively free of the estimated 530 gpm (0.12 cfs) stream flow at this time of the year by a 500 gpm sump pump. It drew from behind a small dike thrown across the river upstream of the dam and discharged through a 6 in. pipe over the dam. By mid-December about 35,000 cu yd of muck had been removed from the reservoir.

Then on Dec. 22 unseasonable rains caused abnormal flows that refilled the reservoir with muck overnight.

• **Approve hole through dam**—With an estimated 250 cfs of flood water coming down the canyon, it was concluded that the only way to keep the site dewatered was to open a hole through the dam base. Early in January, 1956, the Navy approved a 4 x 4 ft hole.

Line drilling and light blasting using 60% dynamite and millisecond delays quickly penetrated the 21 ft dam base thickness. Before the last shot was made there was much speculation as to how the 80 ft of muck over the hole would react. Some thought little would happen, while others believed the configuration would function like a giant sink drain by drawing mud a considerable distance over the reservoir area.

When the plunger for the last shot was pushed, only the rock plug moved at first. Seconds later, fine gravel and mud began oozing out. But a full half hour later, the mud plug shot out with a roar. That afternoon, 10 million gal or about 50,000 cu yd of water and muck raced down the canyon for several miles. Now, not only could the reservoir be dewatered, but muck could be flushed along with it.

• **Filling and flushing**—Muck removal then became a sequence of damming the hole with mud with the stiffleg, allowing water level to rise and finally opening the hole with small charges of dynamite.

This filling and flushing phase was terminated in March when a point of diminishing return had been reached; the flushing removed very little muck. All told, about 40,000 cu yd of muck was removed in this manner, not including the material carried away in the spectacular first flush.

Thereafter, big bulldozers and pans were brought in to aid the Sauerman scraper in bringing muck to the stiffleg. This derrick was also rerigged to accommodate heavier loads. Material moved varied from 12 in. boulders to silt, the rock coming from the considerable outcropping, clearage and decomposed strata of the granite forming Cat Creek Canyon. There was little difficulty in moving the fill when it was dewatered.

The clam shell on the stiffleg piled the material below the dam. A power shovel, bulldozers and pans moved it down along the canyon, forming a roadway and reforming the watercourse.

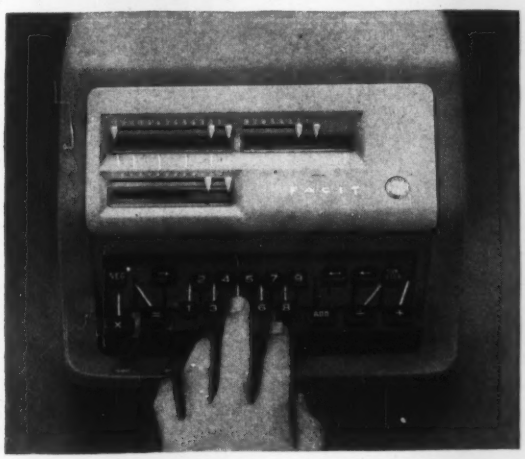
By June, Cat Creek Reservoir was reusable for water supply after a temporary stop gate of 1 in. steel plate welded to rail sections was installed in the 4 x 4 ft hole. Up to this time, restoration work cost $630,000, much of the sum accountable to the rugged working conditions in the canyon.

• **Final work**—Late last year, a $45,000 contract was awarded to T&T Engineering Co., Reno, Nev., to complete the rock and silt removal and install a hydraulically operated 36 in. penstock and sluice gate in the 4 x 4 ft hole through the dam. Material movement this time was accomplished by flushing and belt conveyor system, and the gate installation was wrapped up last month.

The big unanswered question is what will happen if another thunderstorm, the like of that in 1955, hits the basin? After recent geological and forestry surveys, it looks like very little can be done that is economically feasible to prevent a similar occurrence. The sluice gate will help, but if another freak flash flood occurs, all we can do is make sure nobody gets in the way.

The Cat Creek restoration was accomplished by the District Public Works Officer, 12th Naval District, who was Capt. G. K. Brodie, CEC, USN, in 1955 and now is Capt. J. A. McHenry, CEC, USN. Robert E. Layton & Associates, San Leandro, Calif., designed the sluice gate installation. Utah Construction Co.'s work in 1955 and 1956 was directed by Richard Laird and George Jones under the author as resident officer in charge of construction.

Taking into consideration the exposure hazard of the job, it is to the credit of the contractor that there were no fatalities. Safety training and equipment paid dividends. Before starting the restoration all canyon walls in the critical work areas were first cleared of loose rock by high scalers. Early in the job a dozer slipped from a primitive access road and tumbled several hundred feet into upper Cat Cayon; the driver jumped when the cat began to slip and was not hurt.



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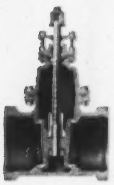

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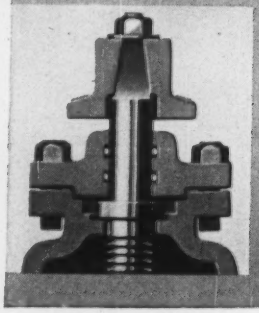

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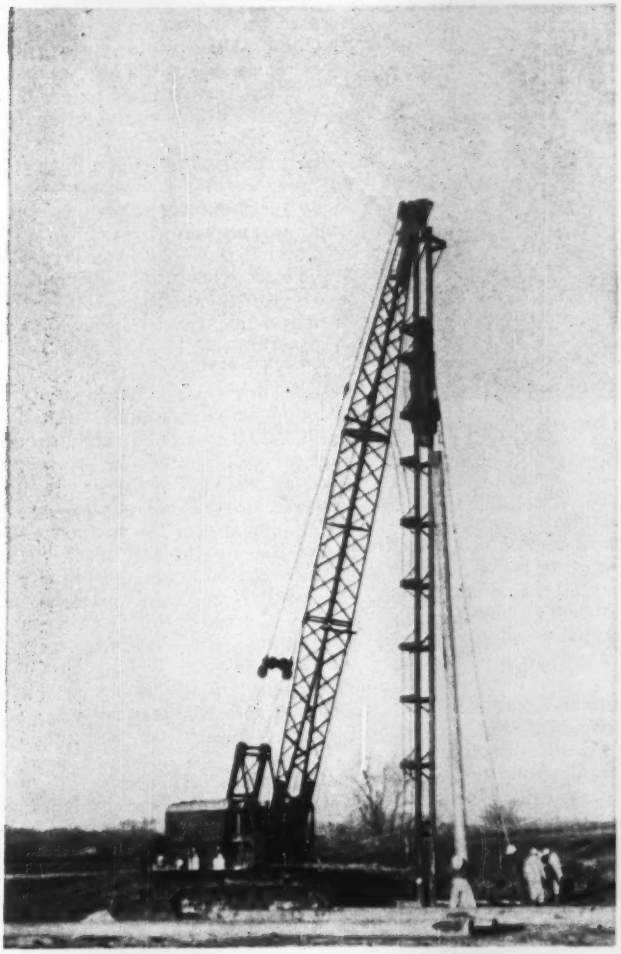
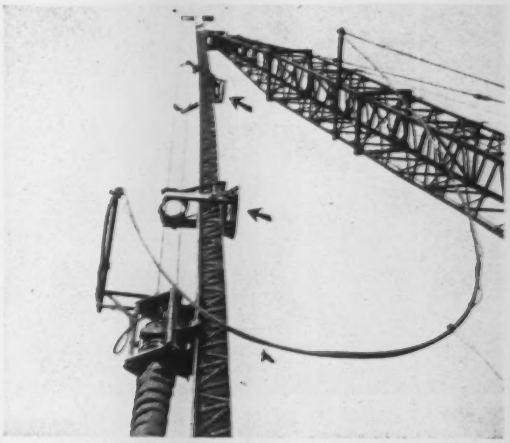
Auger Puts Sand Drains Down 120 Feet



1 WORKMEN SET CASING which will be driven to keep sandy upper stratum from falling into hole. Since auger had to work through the casing, alignment was a big problem for the contractor.



2 HYDRAULICALLY OPERATED GUIDES (Arrows) were designed by contractor to steady the auger during drilling operations. Clamps opened to clear the electric motor powering the bit.

3 VARVED CLAY, which starts 40 to 50 ft below ground and runs to hardpan at about 120 ft, is piled up by auger at the top of the hole.

4 CLAMSHELL TRACTOR SHOVEL made it possible to remove clay from around the hole as auger worked. By lifting the spoil rather than pushing it, the contractor kept from spreading the sticky muck around the site.

STORY CONTINUES ON PAGE 46

Augur puts sand drains down 120 feet

SAND IS DUMPED INTO HOPPER to fill holes after the auger is removed. With hole filled, the upper casing is removed to complete the operation.

How do you install 120-ft-deep sand-drains without casing the holes full-depth during drilling operations? That's the problem that faced White Oak Excavators, Inc. of Plainville, Conn., contractor for approach work on a bridge near Hartford.

Licking the problem called for some unusual methods and equipment.

In normal sand-drain operations, a closed steel tube is driven to the desired depth and filled with sand. Then, simultaneously, as the tube is extracted, the bottom is opened (either by a hinge action or other method) and pressure is applied to the sand to eject it. The remaining—uncased—sand column is then free to collect and carry upward the subsurface water—which is the purpose of a sand drain.

In contrast, White Oak Excavators, bored 1,400 sand drains to a 120 ft depth without the use of casing on the bottom 70 to 80 ft of the holes. Furthermore, the boring of each hole was accomplished with a single pass of a 124-ft-long continuous-screw auger.

This unusual method was required because of finely laminated clay in the area of the approaches to a bridge being built over the Connecticut River south of Hartford. Located between Wethersfield and Glastonbury, it is the last of three bridges constructed for the Greater Hartford Bridge Authority to eliminate congestion on the existing Charter Oak and Buckley Bridges over the same river. The two other new bridges, the Windsor-South Windsor and the Hartford-East Hartford, were opened to traffic late in December last year.

The Wethersfield-Glastonbury Bridge will be a 2,393-ft-long, 14 span structure, which will clear the Connecticut River (navigable at this point) by 80.65 ft above mean high water.

To raise the easterly approach road to required elevation, it was necessary to place as much as 55 ft of fill east of the river. The designer called for sand drains under the fill in a horseshoe-shaped area about 600 ft wide and 700 ft long to reduce the possibility of settlement of the approach after paving.

• **Usual drain methods out**—However, after careful analysis of soil samples, Goodkind and O'Dea, contracting engineers for the bridge authority, and De Leuw, Cather & Brill, the general consultants, decided not to permit sand drain installation by standard means. Borings taken at the site showed a 40 to 50 ft thick stratum of sand overlying an 80 ft layer of varved clay (finely striated layers of silt and clay). The engineers felt that conventional driving of a casing would drag clay across the thin intermittent layers of silt, making the walls of the hole impervious and thereby rendering the sand drain unusable.

For this reason the specification was written:

"The holes for vertical sand drains shall be formed by rotary drilling methods, by jetting an open pipe, or by other methods approved by the engineers, to produce a clean hole with a minimum amount of disturbance to the varved clay deposit. . . . No method which requires the driving of an open or closed pipe or mandrel will be acceptable."

The highly effective—although extremely ticklish—method finally used was the result of considerable trial-and-error experimentation. And although it did the job, the method is extremely susceptible to the vagaries of subsurface soil conditions.

At the start of the work, a 2½ cu yd crane with a 135 ft boom was equipped with standard two-legged pile-driving leads. Four and eight-foot sections of auger, assembled to make the required length, were then suspended from the front of the lead under a 100 hp electric motor. The motor was mounted on the front face of the lead on a slide, and current was supplied by a 100 kva generator mounted on the rear of the crane.

To prevent whip in the long auger, the manufacturer provided two yokes. These yokes encompassed the auger to steady it, and were themselves steadied by working on a slide inside the legs of the lead. They were suspended from the motor frame by chains and, in theory, would move down the leads ahead of the motor until they stopped at ground level.

With this equipment the contractor made his initial attempt to install the drains, and he augered the entire hole from ground elevation to the required depth as called for in the specifications. However, for several reasons, neither the equipment nor the method was up to the job. In the first place the machinery was too heavy and too cumbersome for a 2½ cu yd machine. The boom and leads of this first rig buckled under the weight of the front end (the lead weighed over 6 tons, the motor over 7 tons, and the loaded bit between 7 and 8 tons). Replacement equipment, therefore, consisted of built-up 3½ cu yd machines.

Even before the first rig was discarded it was apparent that the drill guides between the legs of the lead would not work. They were repeatedly binding, and much time was wasted in freeing them so that the drill motor could continue its downward trip.

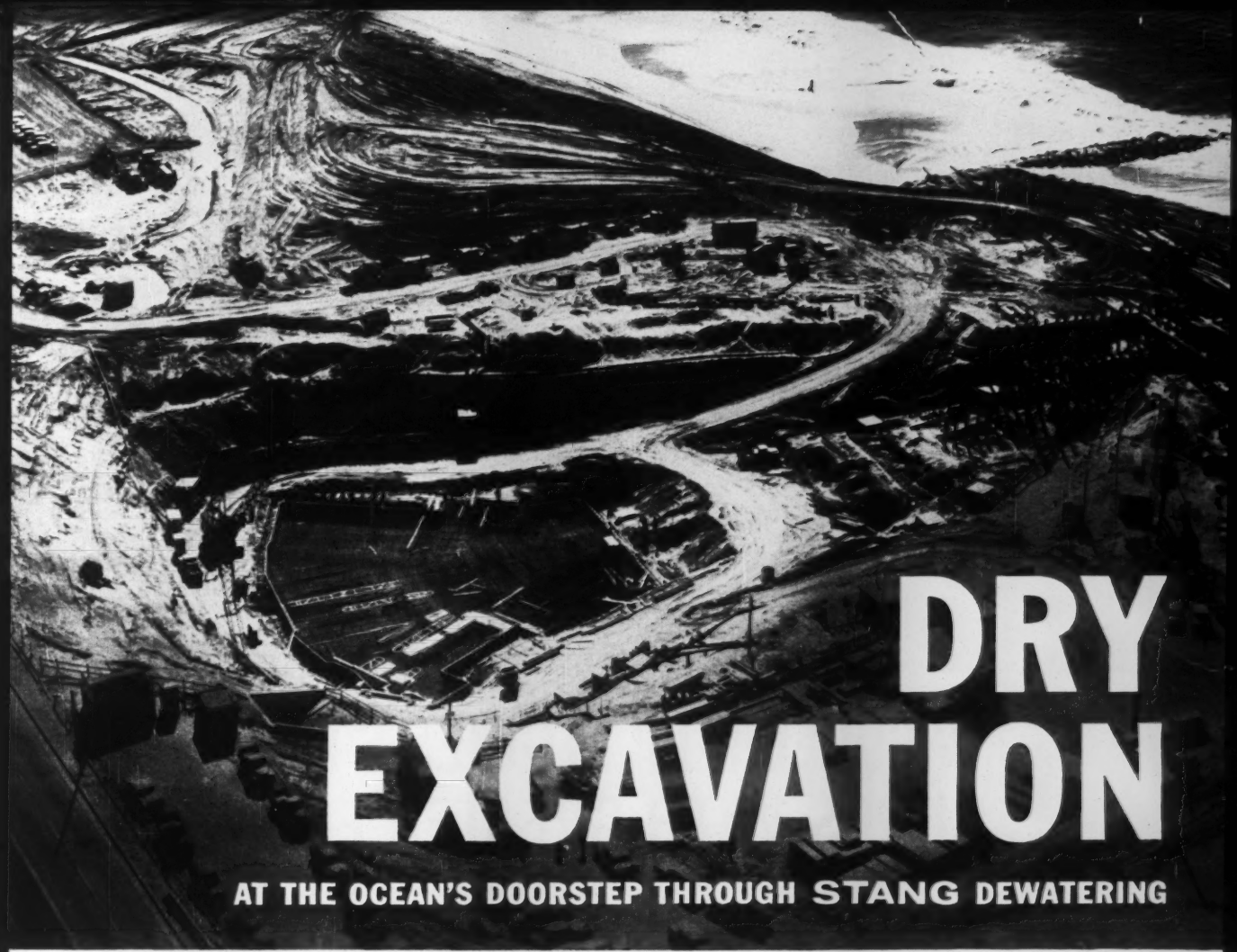
Insofar as the method was concerned, the 40 to 50 ft stratum of sand overlying the clay would not stay in place but kept sliding down into the hole as soon as the auger was removed.

To combat this, the contractor drilled holes in the drill flights immediately parallel and close to the drill shaft. Through these holes, he threaded a 1 in. dia pipe. When the drilling was completed to the required depth, a hose was connected to the pipe and, as the auger was raised, water was pumped into the hole.

The hydrostatic pressure thus created served to hold back the sides of the hole, but the process was too complicated and was found to be too slow to be practical.

In the light of these difficulties the contractor received permission from the engineers to drive a 14 in. dia casing having a ⅜-in.-thick wall through the upper 40 to 50 ft of sand, with the understanding that the casing would be driven only far enough to seat itself in the clay substratum. White Oak then

(*Continued on p. 49*)



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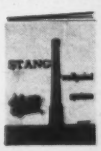

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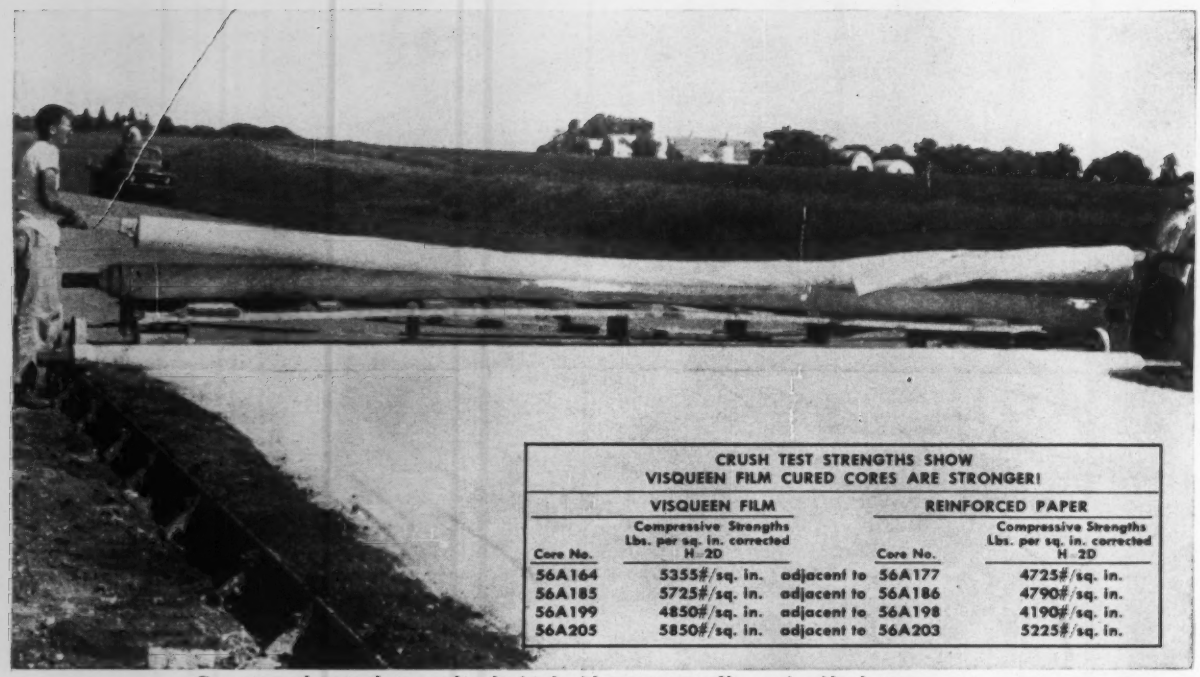

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. . . Augur puts sand drains down 120 feet

designed a single-leg overhead lead made of a reinforced wide-flange section 135 ft long.

The electric motor for rotating the drill was attached to the front face of a roller-mounted plate, which moved freely down the front flange of the lead.

To steady the long auger, the contractor also designed and installed at about the third points on the lead, two spring-loaded, hydraulically activated clamps (on which he has patents pending). These clamps very much resemble the human arm from the elbow to the fingertips with the fingers and thumbs cupped in opposition, as though encircling a cylindrical object.

The clamp arms are pivoted at the back flanges of the lead, with part of the clamp extending behind the pivot point. Between the rear of the clamp arms are two mechanisms—a spring that opens the clamp to permit passage of the drill motor, and hydraulic jacks that keep the clamp closed around the drill as it turns.

A hydraulic jack pump mounted on a pipe A-frame between the crane and the base of the lead permits each clamp to be closed or opened separately. When the auger is in its topmost position, manifolded valves on the lines from the jacks are opened. The pumps are operated, and the two clamps are firmly fixed around the auger. The line valves are then closed to hold pressure on the jacks.

As the bit eats its way into the ground and the motor approaches the upper clamp, the upper line valve is opened. This releases the hydraulic pressure on the upper clamp arms and permits the opposing spring to open the arms for motor clearance. The same process is repeated as the motor approaches the lower clamp.

• **Separate machines used**—Because of the obvious difficulty involved in laying down the 12 in., 124-ft-long auger, the contractor used separate machines for each operation.

One crane carrying a 15,000 ft-lb single-acting, air-activated hammer drove the casing into place in the clay. The driving crane then moved to another location. Next, the machine carrying the auger was set up over the casing, and proceeded to drill through it.

As the auger piled up the sand and clay at the top of the hole, the spoil was removed by one of the handiest rigs on the job—a tractor-shovel equipped with a split bucket that works like a clamshell. (This machine also backdragged the sand bed to give the cranes a smooth run and in addition worked as a bulldozer.) The clam action permitted complete cleaning of the edge of the hole without disturbance of the sand below and without spreading of the muck.

On completion of the boring, the engineers checked the depth of the hole with a chain-suspended weight. The filling was begun immediately to prevent the material around the hole from falling back into it. For this operation a contractor-built hopper was placed directly over the hole. Then a tractor-shovel picked up sand from convenient stockpiles and dumped it into the hopper until the hole was overfilled.

A third crane equipped with a large extractor then hooked onto the casing and pulled it from the ground. A 2 in. dia pin, inserted horizontally through reinforced holes on opposite sides of the casing about 6 in. below the top edge, served as a pulling point. The legs of the extractor worked from the inside of the casing rather than the outside to reduce the bending moment in the pulling pin.

• **Difficulties were many**—Where no difficulties were encountered, the individual operations were occasionally performed in a remarkably short time. However, any one of a number of difficulties could and did appreciably upset the production schedules.

Proper alignment of the casing was one of the contractor's greatest problems. Any subsurface obstruction large enough to move the casing off plumb or deform it made the casing useless, because the tolerances permitted by the drill were very slight.

However, the biggest problem with the casing was in determining the varying elevations at which the sand stopped and the clay began. To permit insertion of the auger, the top of the casing had to be almost flush with the ground. If when the top of the casing was at grade the bottom was driven too far into the clay, extraction was slow and difficult, and the engineers protested against disturbing the clay. On the other hand, if the casing was so short that its bottom was not driven into the clay, the hole was lost when the auger was removed, because the sand then ran into the hole below.

Rocks and wood were another source of trouble. The length of the auger made it extremely susceptible to both bending and breaking. Encountering tree stumps or other debris below the casing cost the contractor a great deal of time, and on occasion resulted in the loss of expensive drilling equipment.

Stones—small enough to lock in the drill flights but too large to come up between the casing and the flights, presented another hard-to-beat problem that cost time and money.

The height of the rigging was another

(Continued on p. 50)

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D-12:
22500 FT. LBS.

D-22:
39700 FT. LBS.

DELMAG DIESEL PILE HAMMERS have proven outstandingly successful in the driving of all types of bearing piles and sheet piling. Actual job experience shows much less damage to pile heads, particularly important in driving steel sheet piling.

DELMAG DIESEL PILE HAMMERS are light in weight yet develop tremendous energy per blow. The weight of a DELMAG HAMMER is approximately one-half that of a steam hammer with a comparable energy rating. This results in a tremendous saving on the size of handling equipment required and makes for a much more mobile pile driving operation. Since no outside source of power is required, setup time and moving time is greatly reduced.
The experience gained through 20 years of actual on the job operation has been incorporated in DELMAG'S simple and sturdy construction, resulting in very low maintenance costs.

Since fuel consumption is very low, savings in fuel is a major item in operating costs.

Write for bulletin giving more detailed description

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. . . Sand drains augered

problem. Because of it, an electrical connection coming loose with the motor at the top of its run amounted to a major breakdown, since no electrician could be induced to climb the equivalent of 14 floors above the ground on the single beam lead. At one time a broken hoist cable resulted in complete loss of the auger and damage to the electric motor.

These difficulties, coupled with a tight schedule called for all the ingenuity the contractor showed in accomplishing a difficult job.

New Orleans Bridge Opened On Limited Approach Basis

The $65 million Greater New Orleans Bridge, which spans the Mississippi River from New Orleans to the west bank of Jefferson County, is now open to traffic six months ahead of schedule on a limited approach basis.

The Mississippi River Bridge Authority put the 2.3 mile long bridge into use before completing all approaches in a move to alleviate traffic congestion on both sides of the river. Work on a number of access ramps and approach streets is expected to be finished in October.

The main river crossing of the bridge is 3,019 ft long and consists of three cantilever spans. The 1,575 ft long central span is the longest cantilever structure in the U.S. and the third longest in the world.

Wide Beaches Will Resist Erosion and Hurricanes

The Beach Erosion Board of the Army Corps of Engineers has developed a method of beach construction that will provide protection against both beach erosion and hurricane. It is to be employed on the hurricane-prone shores of Rhode Island and Connecticut.

According to the new plan, existing beaches would be widened to 300 ft. They would then consist of a 100 ft level berm 14 ft above mean sea level and a 200 ft section sloping seaward. A low gravity or precast concrete sheet pile wall would be erected at the landward side of the berm and behind this wall there would be a 15 ft wide promenade extending the length of the protected area with gentle slopes blending into the existing streets.

This method will cause the larger waves to break on the shore and their energy to dissipate as they roll upon the widened beach. With dissipation of the waves only a low wall on the landward side of the berm that projects some 2½ ft above the berm would be required to prevent overtopping by small waves.

Where Huge New Stores of Power Will Be Created. One of the great construction jobs of our time is under way at the International Rapids section of the St. Lawrence Seaway project. The magnitude of the task is well illustrated by the view above, which shows work in progress on the Barnhart Island power plant. When completed, the giant installation will straddle the boundary between the United States and Canada, providing vast new stores of power for both nations.

Big gantry cranes have been tireless workers at many key points of the job. To handle the high, unwieldy lifts, they must be rigged with tremendously strong wire rope, and large quantities of Bethlehem Purple Strand have been furnished for the purpose. This tough steel cable, in both the ⅞-in. and 1⅛-in. sizes, has always proved a willing worker, and more than a match for the heavy loads assigned it.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

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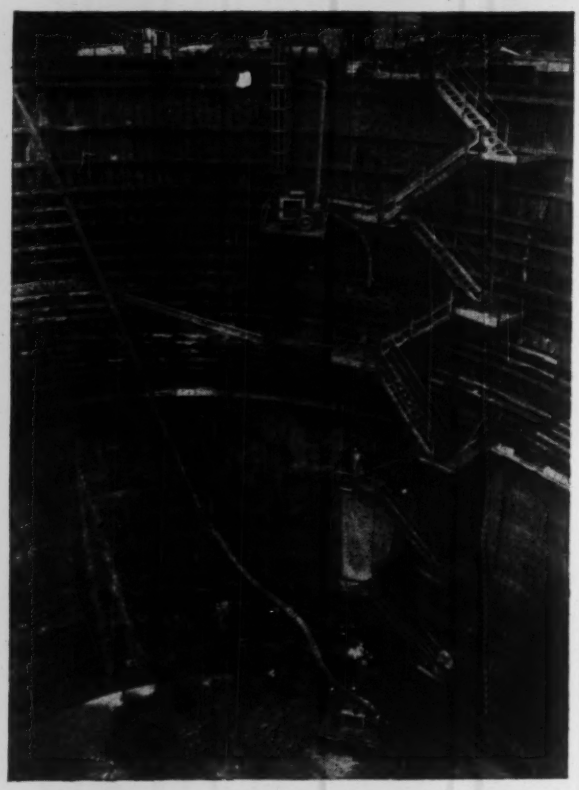
New Construction Idea News

110-FT. DIAMETER GIANT HOLE is braced by sectionalized 8-in. wide-flange beams, 40 lb. per ft., 21 ft. long, and bolted at the ends. The accurately curved rings by COMMERCIAL back up sheet piling driven in running ground and intermediate layers of water-bearing gravel and boulders.



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127-FT. DEEP EXCAVATION for the Pittsburgh pump station foundation is shored to meet developing load conditions by COMMERCIAL ring walers installed on varying centers.

Ring walers

World's largest steel-ring walers — engineered by COMMERCIAL—provide unobstructed interior working areas for giant excavations . . . speed tricky riverside foundation jobs at New Albany, Indiana and Pittsburgh.

The problem: How to excavate deep pits for two different mammoth foundations a couple hundred feet from the Ohio River—without using the time-consuming, expensive conventional lacework of jacks and vertical and horizontal braces which interferes with excavation and concrete pouring.

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The contracting firm of McHugh, Allegheny & Drake did it on a giant, circular-shaped foundation — for a pumping station — on the Ohio River at Pittsburgh, as part of the $100-million Allegheny County Sanitary Authority project.

And it was accomplished on an even larger power station foundation—in the shape of a double cross—being built by

(*Advertisement*)

"A DEFINITE SUCCESS", say Charles Brooks, Project Engineer (left) and O. W. Simmon, Superintendent for Gust K. Newberg Construction Co. COMMERCIAL engineered ring walers brace their foundation excavation job — 60-ft. deep, 210-ft. long and 96-ft. wide — on the Ohio River at New Albany, Indiana.

keep large pits completely open

the Gust K. Newberg Construction Co. for the Public Service Co. of Indiana, Inc. at New Albany, Indiana.

In both cases, COMMERCIAL engineers, working with the contractors and project engineers, were able to come up with the answers which spelled faster, interference-free excavation and concrete pouring.

For the full story of how COMMERCIAL steel-ring walers were used in the cofferdam excavation at New Albany, Indiana, send for your copy of Bulletin 300-P1. If you have a similar excavation problem, or if you have a support design challenge involving a shaft, surface or subsurface tunnel project, whatever the size—large or small, we may be able to suggest an equally practical and economical solution based on our more than 25 years of experience in the design of supports for soft ground or rock excavation. Send details to Commercial Shearing & Stamping Company, Dept. E-20 Youngstown 1, Ohio.

PHOTO COURTESY L. B. FOSTER COMPANY

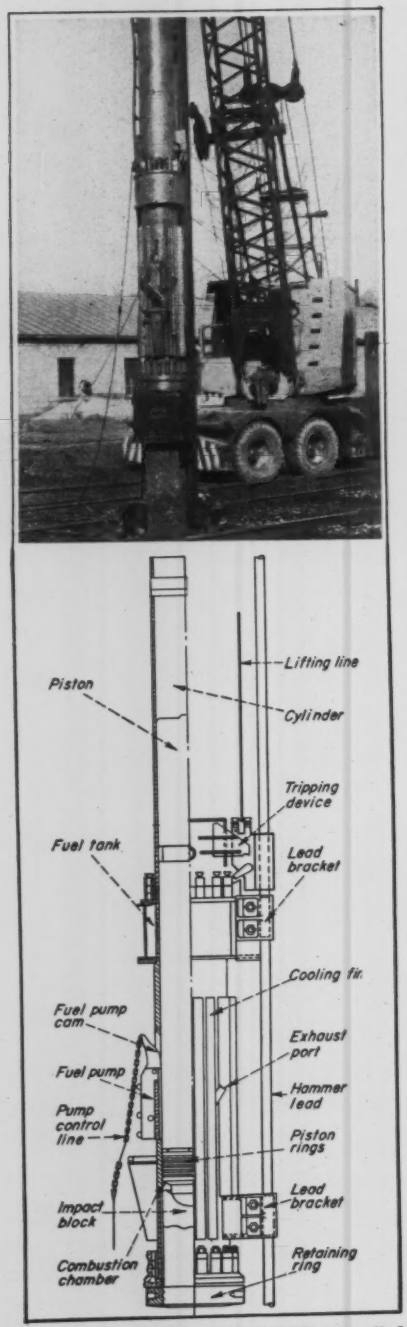
CURVED-WALL COFFERDAM on the New Albany power station project of Public Service Co. of Indiana, Inc. is walled by three intersecting circles of wide-flange beams fabricated by COMMERCIAL — requires only two rows of steel strut bracing.

How Good Are the Diesel-Powered Pile

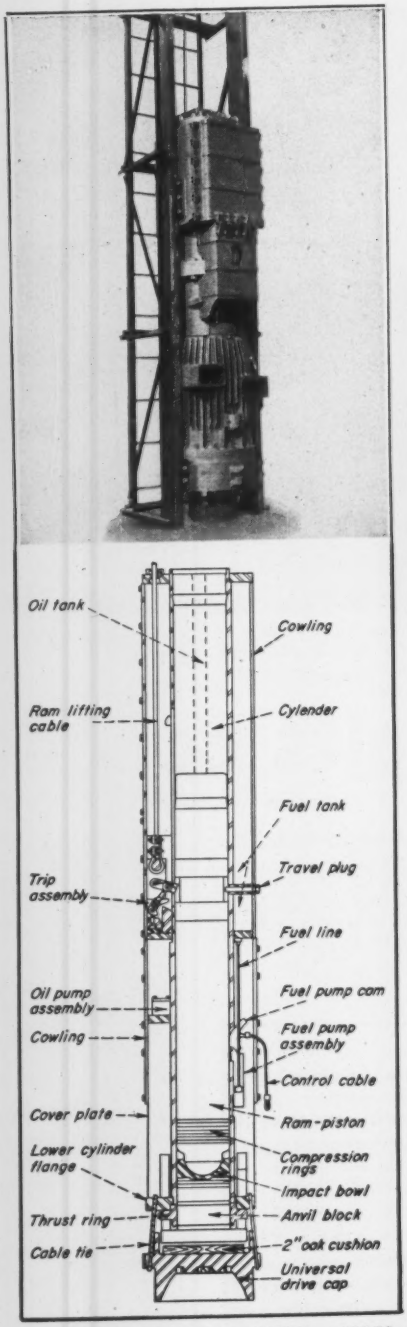
Edward M. Young, Jr.
Associate Editor

When steam passed out of the general construction scene as motive power, pile driving was still open to it—for until recently, steam was the only practical source of power for standard pile hammers. The development of large portable compressors has prolonged the use of steam-type hammers. Since air could be substituted for steam and this has, to some extent, reduced the need for expensive, single-purpose steam equipment. But in doing so, it added the problems of cumbersome bulk and of dragging hoses.

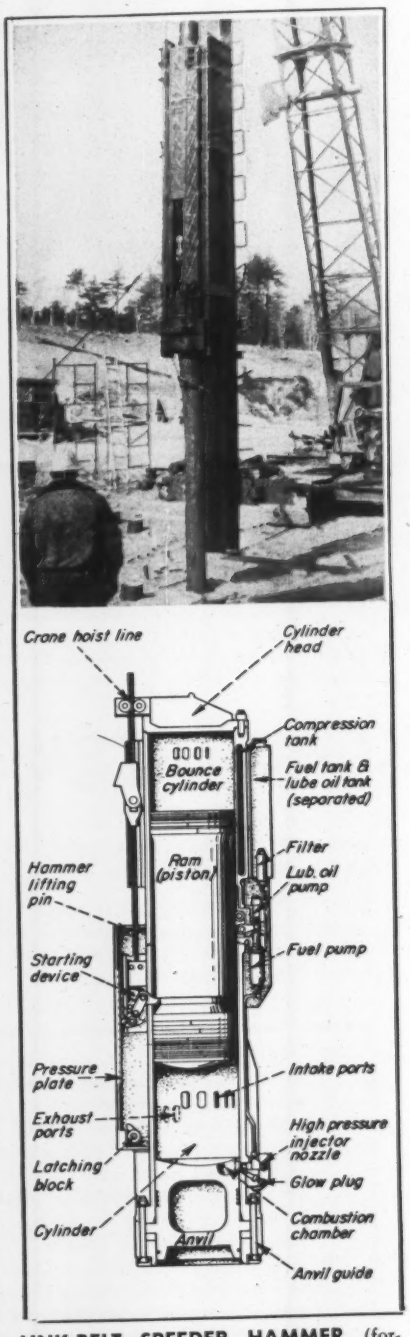
The ideal answer to the problems of



DELMAG DIESEL HAMMER, handled by a light truck crane drives a BP section between railroad tracks.



McKIERNAN-TERRY DIESEL HAMMER, mounted ahead of steel H-section lead installs wood piles for bridge pier.



LINK-BELT SPEEDER HAMMER (formerly the Syntron) has a cylinder head which shortens and speeds the ram stroke.

Hammers?

pile driving equipment will be found in a small, light, self-contained, and self-activated pile hammer. Right now, the diesel pile hammer is making a bid for the position—but with varying degrees of success.

The diesels now in use in the U.S. can be adapted to almost any crane; they are economical, light, safe, and effective for hard driving.

However, accurate calibration of their energy output is complex, they do not work well under conditions of extremely "soft" driving, and their blow rate is slower than that of many steam-air hammers.

• **Design principles**—Diesel hammer design is simple. There are three principal machines on the U.S. market, the Delmag, the McKiernan-Terry, and the Link-Belt Speeder (formerly known as the Syntron). Each hammer has its own modifications and—according to the respective manufacturers—its own advantages. But in fundamental operation all are similar.

Basically the hammer itself consists of little more than a cylinder-encased ram, an anvil block, a simple lubrication system and, except for the Link-Belt, an even simpler fuel injection system.

To start operations, a cable from the crane lifts the ram. At the top of the stroke, the lifting attachment is tripped and the ram drops. As it falls, the ram actuates a fuel metering pump which in turn injects the fuel into the cylinder. The heat generated by the compression of air between the anvil block and the falling ram ignites the fuel and the resulting explosion drives the anvil block down and the ram upward for a repeat of the cycle.

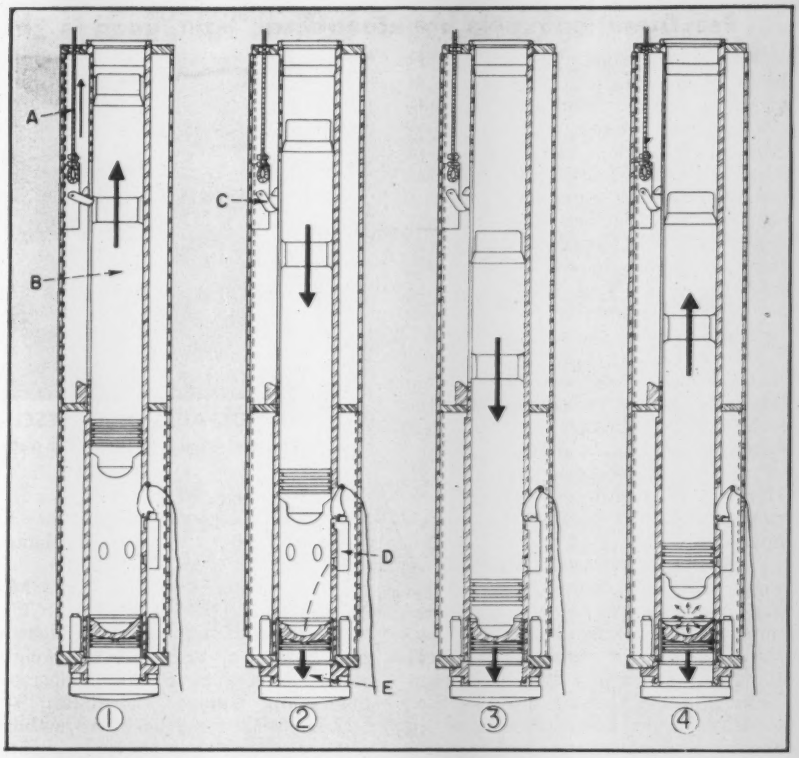
While the general cycle of operation is the same for all three hammers, certain design variations—particularly within the Link-Belt—caused differences in the details of the operating cycle. In the McKiernan-Terry and the Delmag, which both stem from the same basic patents, the fuel is squirted, in its raw, liquid state, into a cup in the anvil block. As the ram strikes the block, the liquid is atomized by the impact and ignited by the heat of compression.

The impact of the ram drives the anvil block downward, and the almost instantaneous explosion adds to the downward force of the block, while at the same time sending the ram upward. The upward stroke of the ram automatically opens the exhaust ports to permit scavenging of the gases of combustion.

Since the cylinder is open at the top, the ram rises unimpeded until gravity stops it and causes it to fall again. As the ram drops, it closes the exhaust ports and the driving cycle repeats itself. The Delmag and the McKiernan-Terry hammers are stopped by a pull on the rope which disengages the fuel pump cam.

Because of two features not found in the other two machines, the Link-Belt cycle is different in detail. A high-pressure fuel injection system atomizes the fuel as it is injected into the combustion chamber, and permits the operator to control both force of the blow and the stopping of the hammer from his cab.

While the Delmag and the McKiernan-Terry diesels permit the top of the ram to come out of the cylinder on the upward stroke, the Link-Belt has a cylinder head. As the ram rises, it compresses air against the cylinder head and in two compression tanks. This becomes a "bounce chamber" which shortens the upward stroke and speeds the downstroke thereby increasing the blow rate. A battery-operated "glow plug" is claimed by the manufacturer to help ignition in cold weather and to facilitate hammer operation under conditions of "soft" driving.



BASIC OPERATION of the diesel pile hammer is shown in these drawings of a McKiernan-Terry machine. 1. To start, cable *(A)* from crane lifts piston or ram *(B)* 2. Tripping device *(C)* releases piston permitting it to drop. The gravity fall of the piston activates the fuel pump *(D)* causing it to squirt a thimbleful of fuel into the cup of the anvil block *(E)*. Compression of air beneath the falling piston preloads the anvil block and seats it firmly on the pile. 3. Impact of piston drives anvil block downward and explodes fuel. 4. Expanding gases add to the downward movement of the anvil and starts the piston upward for an automatic repeat of the cycle. Arrows indicating the direction of forces show that for most of the operation cycle there is a downward pressure on the pile.

• **Not the final answer**—In spite of its simplicity and easy adaptability to standard cranes, the diesel hammer cannot be regarded as a panacea for all pile-driving problems. Like any other piece of equipment, the diesel hammer has its limitations. Proper evaluation of its potential role warrants an analysis of its features.

On the plus side:

1. **The diesel hammer is independent of outside power supplies.** The user is free of the inconvenience and expense occasioned by the boilers or compressors needed for operation of the steam-air hammers. Mobility of the pile driving equipment is increased, and the rigging or set-up time is reduced.

2. **The hammer is economical.** According to both manufacturers and users, the biggest of the hammers, the Delmag D 22 with a 39,700 ft-lb energy rating burns less than 3½ gal

. . . Pro: Diesel hammers are economical, light, good in "hard" driving

of fuel oil per hour. The Delmag D 12 at 22,500 ft-lb uses a maximum of 1¾ gal of fuel per hour while the D-5, a 9,100 ft-lb hammer gets by on less than a single gallon of fuel per hour. The McKiernan-Terry and Link Belt machines are correspondingly conservative on fuel. Furthermore, since the figures are based on continuous operation—a condition rarely found in the field—the actual fuel consumption of any of the hammers will be less than that admitted by the manufacturers.

Beyond the direct savings in buying fuel, there is a less obvious but often more important advantage in the limited fuel requirements of the diesel. Often pile driving is done in swampy or muddy areas where access is difficult. Here workmen can easily carry sufficient fuel to the hammer for a day's operation.

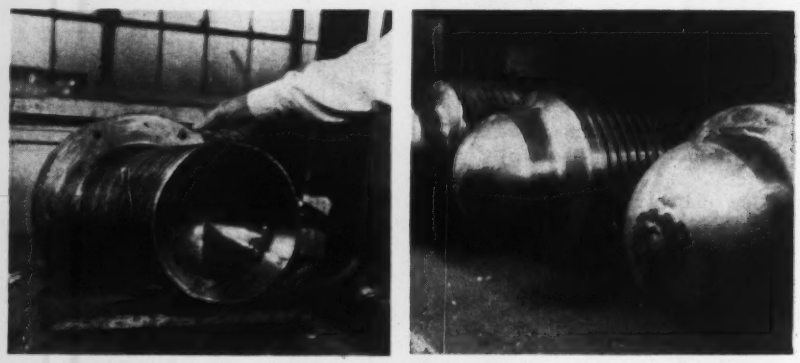
3. **Maintenance and servicing is slight and fast.** Simplicity of design and a subsequent reduction in the number of working parts minimizes the possibility of mechanical difficulties. (In this respect the McKiernan-Terry and the Delmag probably have an edge on the Link-Belt because the absence of high-pressure fuel injection systems and electrical auxiliary ignition systems reduces the number of working parts.)

4. **The hammer is effective in hard driving.** Where the driving force on other types of pile hammers is limited to that created by the impact of the ram, the diesel actually exerts three separate forces on the pile: preloading (by virtue of the compression of gases in the combustion chamber on the down stroke of the ram); ram impact; the forces of explosion.

No claims are made as to the independent value of preloading in actually driving a pile. However, preloading does seat the driving head firmly on the pile and in doing so permits maximum effectiveness of the impact and explosive forces that follow. This positive seating of the helmet at the point of ram impact also greatly reduces damage to the pile butt.

Immediately after preloading, the sharp blow of the ram overcomes the static inertia of the pile, and the expanding gases of combustion then add a pushing force which extends the time duration of the force against the pile and helps to keep the pile in motion.

Furthermore, since the length of the stroke is proportionate to the resistance offered by the pile, the harder the driving the more effective the hammer. This is particularly true of the McKiernan-Terry and the Delmag hammers which depend entirely on the impact of the ram for the ignition of the fuel.



WORKING SURFACES OF A DIESEL HAMMER are shown in these close-ups of a McKiernan-Terry anvil cup (left) and piston head (right).

Oddly enough, in this particular feature of the diesel hammer also lies its greatest weakness, as will be explained subsequently.

5. **The hammer is light.** The McKiernan-Terry DE 30, rated at 16,000 to 18,000 ft-lb but capable of delivering a blow of up to 22,400 ft-lb, weighs only 4 tons. The closest comparable single-acting hammer, the Vulcan No. 1 (15,000 ft-lb) weighs 5 tons without a pile helmet, while the only slightly larger Terry 11 B3 (19,150 ft-lb) scales at 7 tons and the smaller 10 B3 (13,000 ft-lb) weighs just under 5½ tons.

The Link-Belt, because of its accessories and the heavy ram required by its short stroke, is the heaviest of the diesel hammers. Yet the Link-Belt 520, a 30,000 ft-lb hammer with a rated energy of 30,000 ft-lb, weighs only 12,500 lb as compared with the 18,300 lb weight of the McKiernan-Terry S8 single acting steam hammer which has a rated output of only 26,000 ft-lb. Delmag in all classes is the lightest of the three hammers. The D22 which has a rate of energy of 39,700 ft-lb, weighs only 8,919 lb. The D12 rated at 22,500 ft-lb scales at 5,324 lb while the D5 weighs only 2,200 lb.

6. **Safety.** Because pile resistance is a requisite for continued operation of all diesel hammers, none of them will continue to strike a broken pile nor continue to operate if a pile falls out from under the anvil. This feature protects men working nearby and keeps the hammer from tearing itself apart by having its ram strike the anvil in the absence of an opposing force from a pile below.

7. **Universal drive caps are available for some makes of diesel hammers.** McKiernan-Terry, for instance, equips its diesels with a single drive head capable of handling several sizes of pipe, timber, and H-columns. With the simple insertion of a filler pad, the same head will also handle precast concrete piles up to 18 in. in dia. Similar caps are available for Delmag hammers. On jobs where several different types of piles or different sizes of the same pile type are required, the time saved by not having to shift driving heads can be appreciable.

8. **Cold weather operation is simple.** At extremely low temperatures, the starting of a diesel hammer is no easier than the starting of any other internal combustion engine and fuel additives are usually required. However, once started, the hammers will continue to operate easily in temperatures far below the normal operating range of steam-air hammers. It has been reported that a Delmag D-5 was used in Duluth, Minn. at temperatures as low as −18F. Furthermore, at the close of a day's work, there are no water, steam or air hoses to disconnect and drain, and there are no boilers to keep heated overnight or over a weekend.

On the negative side:

1. **Accurate determination of the energy output of diesel hammers is difficult.**

So confused is the energy calibration problem, that even the manufacturers do not agree on the method of its computation. McKiernan-Terry rates its hammers by multiplying the ram weight in pounds by the measured length of the ram stroke in feet. Delmag arrives at its ratings by computing the energy of the fuel injected. The Link-Belt Company, however, considers not only the two factors used by McKiernan-Terry and Delmag, but also several other factors—including the effect of the bounce chamber.

Information advanced by each manufacturer in defense of his own method of energy calculation (substantiated to some extent by the results of field tests) indicates that there may well be some merit to all three calculations. However, all three methods are, in varying degrees, open to dispute.

The McKiernan-Terry rating is un-

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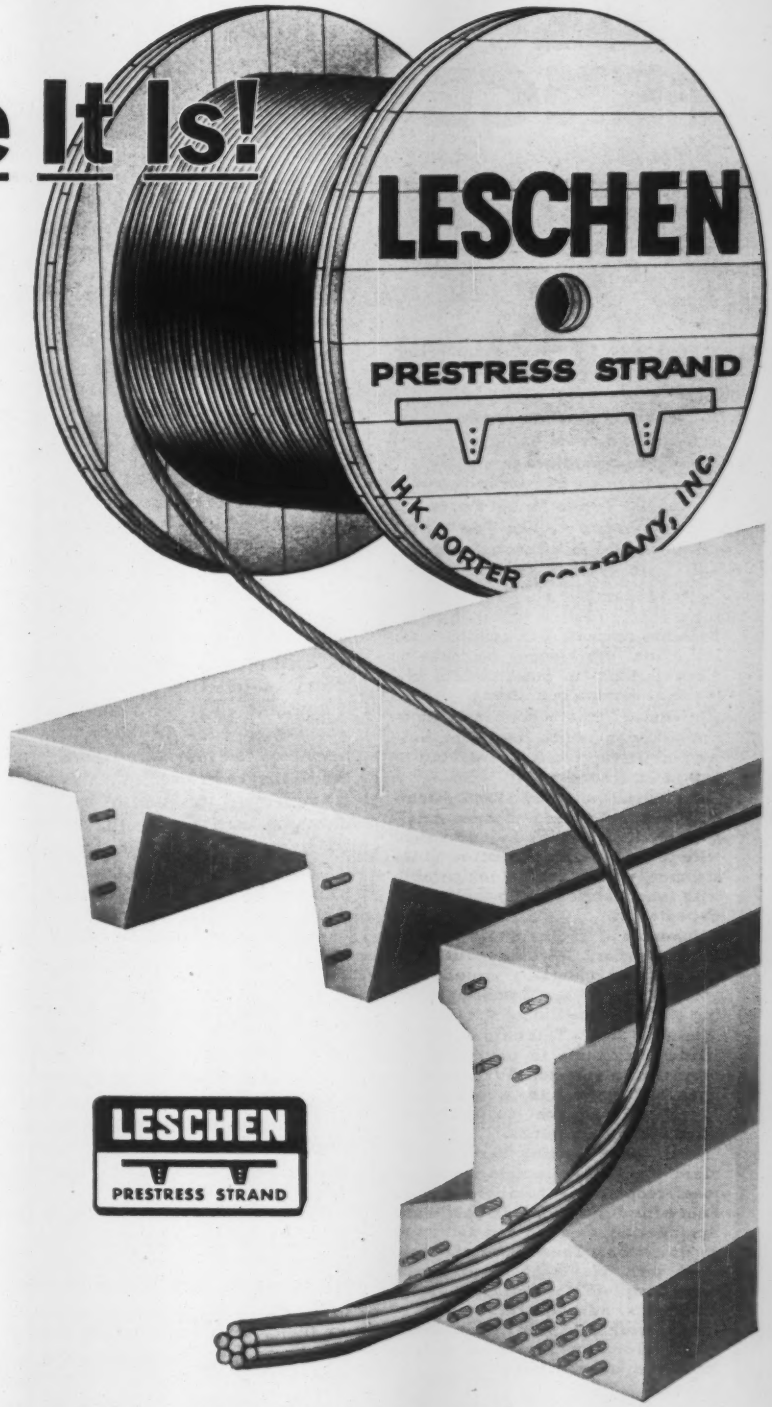

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. . . Con: Diesel hammer rating is confused

the easiest to explain. Every Terry diesel carries a scale that measures the height of the ram fall at each stroke. Since the ram weight is a constant, a minimum hammer energy at any given stroke can be reasonably established. It can be argued—and rightly so—that no consideration is given to the energy losses resulting from friction and from the compression of air in the combustion chamber. However, no claim is made for the effect of the explosion, which in normal operation will more than compensate for the unconsidered energy losses.

Delmag, in considering the effect of explosion, claims a more realistic approach to the question of energy calibration—and while this may be true, it is a more complex approach. The explosion is undeniably an effective force in pile installation, but the extent of its effectiveness is open to debate.

However, Delmag contends (quite reasonably) that except during the starting cycle when the piston is raised mechanically, the hammer energy is completely derived from the fuel burned. Thus, if the amount of fuel for each cycle is the same, and the efficiency of the system, including losses, is constant, then the amount of energy available is constant regardless of the height of the ram fall. Delmag further holds that whatever effective combustion energy is not used to push the pile down, is used to lift the piston, and the potential energy of the piston at its topmost position is available in the form of kinetic energy when it comes down and strikes the pile. (This explanation admittedly neglects certain losses such as those occasioned by heat and friction, but the omission is for simplification, and does not alter Delmag's premise that the energy of the hammer is constant.)

The calibration of the energy of the Link-Belt is extremely complex and for all practical purposes academic—since the energy can be changed at will by the operator controlling the fuel valve.

Even with a constant fuel intake, the Link-Belt is subject to energy variations because the combustion rate of an atomized fuel is the function of both temperature and pressure. Thus an increase in temperature will, at an equal pressure, speed the combustion rate and change the energy output.

The questions pertaining to energy determination of diesel hammers can cause contractors a great deal of trouble, particularly if the resident engineer is skeptical of piles to begin with. In general, field engineers downgrade the manufacturers' energy rating of the diesel hammers. (The McKiernan-Terry machines are probably the least subject to downgrading because the method of computing their energy is easily understood and is obviously conservative.)

However, it is only fair to point out that the problem of energy determination is not restricted to diesels. The energy of a double acting steam or air hammer will vary considerably with the steam or air pressure applied, and even with the diameter or length of hose used to get the power from the tank or boiler to the hammer. To a much lesser extent, the energy of a single acting hammer can also be varied by the same factors.

And one other important consideration—even when a steam-air hammer of known energy is used, the bearing value of a pile is still largely a matter of conjecture. Nothing but a load test will give an accurate answer, and that only for the pile tested.

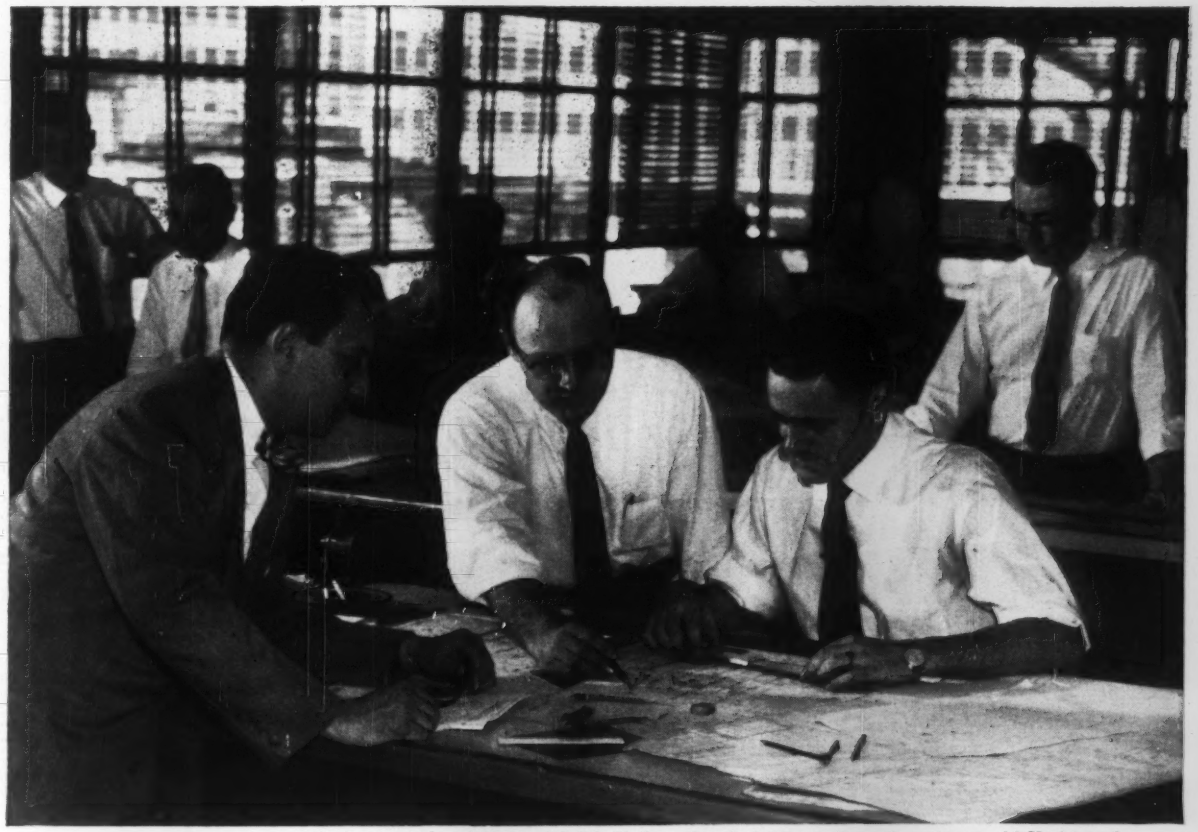
2. **Extremely "soft" driving can be a problem.** Whereas the steam-air hammer is started by the opening of a valve, the diesel requires a mechanical assist from the crane. In ordinary or hard driving this mechanical starting is not a problem. When the driving is very easy, however, the pile contractor is confronted by one of the diesel's greatest weaknesses—its inability to reactivate itself in the absence of pile resistance.

Whenever piles tend to "run", the diesel hammer may become a drop hammer. For unless sufficient static and dynamic resistance is offered by a pile, the ram or piston of the machine will not "bounce" high enough to permit scavenging of the gases of combustion nor high enough to reactivate the fuel pump. It is necessary, then, to raise the ram by pulling it up with a cable.

Under extreme conditions, this characteristic of the diesel hammer could result in the driving of virtually the full length of the pile by a series of lifts of the ram by the crane.

According to users, this problem exists to varying degrees in all three makes, but under most conditions it can be minimized and often eliminated by use of the proper size hammer. The amount of resistance required for reactivation of a diesel varies in proportion to its size. For this reason, a small hammer will sometimes do a good job where a larger machine will not run. The manufacturers are well aware of this and are not only willing to, but in fact, are insistent on recommending the correct hammer size for a given job.

3. **The hammer is long.** Being basically a single-acting hammer and, therefore, dependent for its effectiveness on the long drop of a heavy ram, the diesel hammer must of necessity be a long machine. (The exception to this is the Link-Belt which, because of



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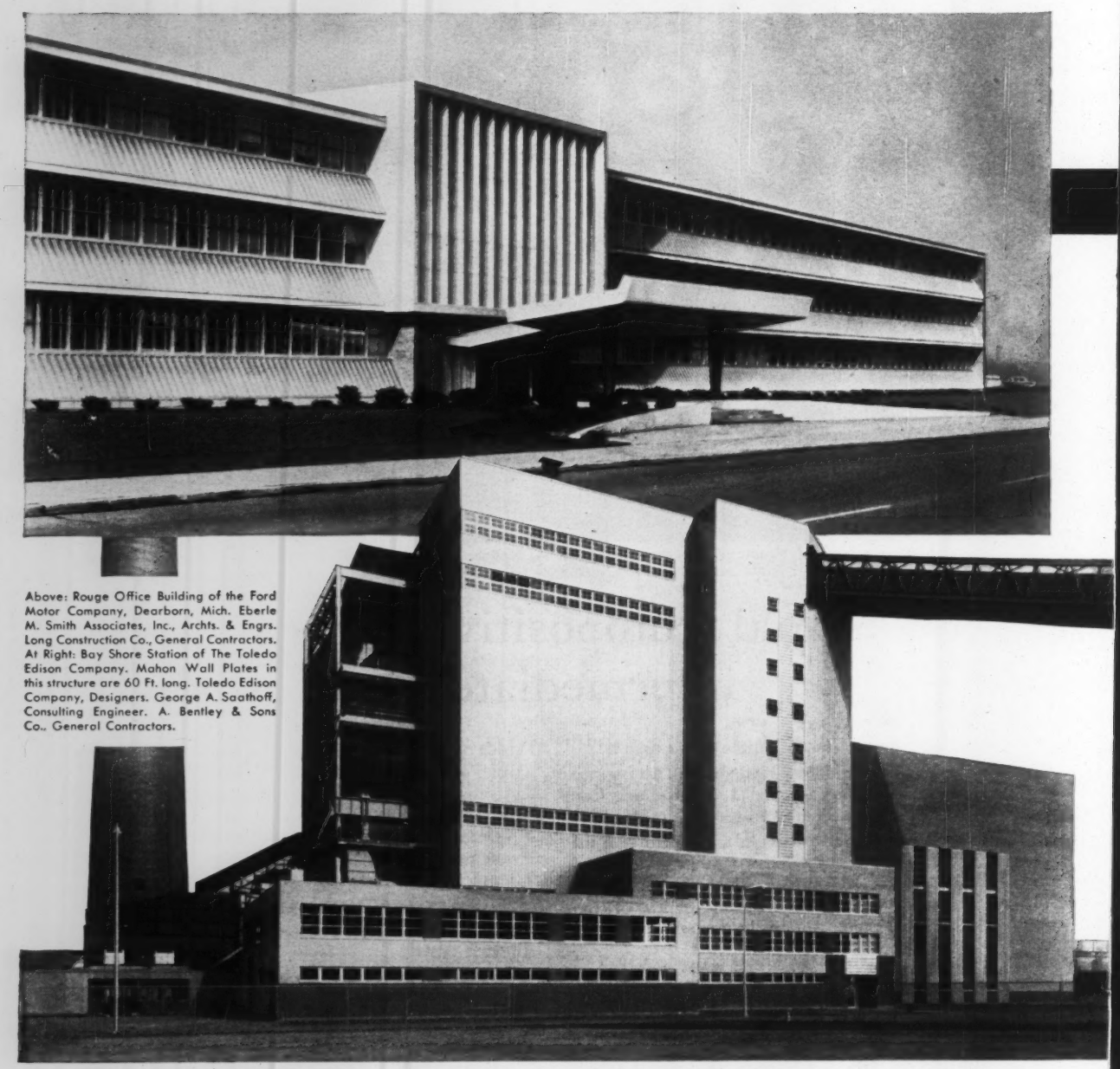

Above: Rouge Office Building of the Ford Motor Company, Dearborn, Mich. Eberle M. Smith Associates, Inc., Archts. & Engrs. Long Construction Co., General Contractors. At Right: Bay Shore Station of The Toledo Edison Company. Mahon Wall Plates in this structure are 60 Ft. long. Toledo Edison Company, Designers. George A. Saathoff, Consulting Engineer. A. Bentley & Sons Co., General Contractors.

Serving the Construction Industry Through Fabrication of Structura
Steel, Steel Plate Components, and Building Product

can be Erected up to 60 Ft. in Height Without Unsightly Horizontal Joints!

Vertical Joints are Invisible . . . Symmetry of Pattern is Continuous Across the Wall Surface

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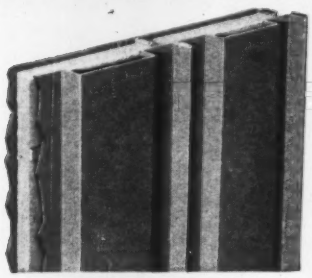
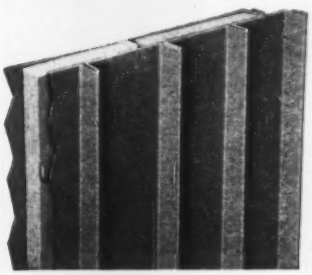
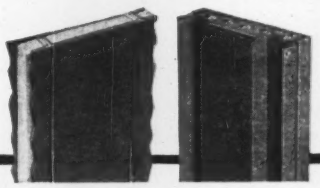
GALVANIZED or PAINTED STEEL



MAHON FLUTED WALL
FIELD CONSTRUCTED



MAHON RIBBED WALL
FIELD CONSTRUCTED



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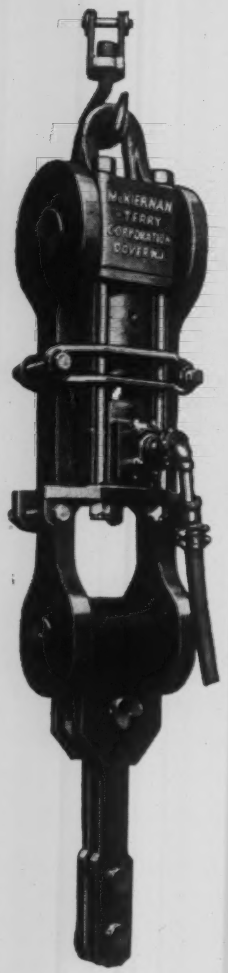


PILE EXTRACTORS

Models E2 and E4, rated for 50- and 100-ton crane pull respectively, provide rapid, low cost extraction of heavy piles from the toughest embedment. Powered by steam or air. Write for Bulletin 58.

. . . Con: Diesel hammers are slow, long

its added weight and its cylinder head is actually shorter than a corresponding Vulcan single-acting steam hammer and but slightly longer than a corresponding Terry double-acting steam hammer.)

Both the McKiernan-Terry and Delmag diesels, while comparing favorably with most single acting steam-air hammers, are appreciably longer than double acting steam air hammers of corresponding ratings.

The McKiernan-Terry DE 30, which delivers an average blow of 16,000 to 18,000 ft-lb, has a base length of 14 ft as opposed to the 8.75 ft length of the new Terry C 5, a steam or air-activated machine of corresponding impact.

In addition to the basic length of the Terry and Delmag diesels, additional clearances are required above the hammer to allow for the protrusion of the ram on the initial upward stroke. Obviously, therefore, the extra hammer length required by the Terry and the Delmag hammer reduces the length of pile which can be driven with a lead of any given length. (Although the Link-Belt does not have this particular disadvantage, its use is complicated by the control lines running from the cab to the hammer.)

4. **The hammer is not fast.** While the Link-Belt, with its 80 to 105 blow-per-minute rate is considerably faster than either the Terry or the Delmag (principally because of the bounce chamber action) even the Link-Belt is slower than many corresponding double-acting steam hammers.

This is particularly true in the smaller models. The Link-Belt 105, a 7,500 ft-lb hammer strikes from 90 to 98 blows-per-minute, whereas the Vulcan No. 30 C at 7,260 ft-lb strikes at the rate of 133 blows-per-minute, and the McKiernan-Terry 9 B 3 at 7,750 ft-lb strikes 145 blows-per-minute.

In the middle bracket, the Link-Belt 312 at 18,000 ft-lb has a blow rate of 100 to 105. This puts its speed ahead of the Vulcan 1 at 60 blows, but behind the Vulcan 50 C (a 5,100 ft-lb hammer) which strikes at the rate of 120 blows-per-minute. Its speed is on a par with the McKiernan-Terry 10 B 3 steam hammer rated at 13,100 ft-lb which also strikes 105 times per minute.

In the larger class, the Link-Belt 520, 30,000 ft-lb hammer, striking 80 to 84 blows-per-minute, runs ahead of the Vulcan O R at 50 blows-per-minute, but behind the Vulcan No. 80 C at 111 or the Vulcan 140 C at 103.

The speed difference between the diesel and the steam hammer is more noticeable in the Terry and the Delmag diesels because of the straight gravity return of the ram. The McKiernan-Terry machines work at 48 to 52 blows-per-minute, while Delmag hammers run at 50 to 60 blows. Since under normal conditions the rate of pile installation of any given hammer is proportionate to its speed, the slowness of the diesels may be a consideration in figuring driving time.

It is apparent that the diesel pile hammer has its advantages and its disadvantages. The net of the favorable and unfavorable factors relating to the use of the machine will have to be determined by each potential user.

Water Forecast

Best condition in years predicted for the West

Ideal water conditions are forecast for much of the West as result of heavy precipitation this year.

Water-hungry areas will have the best water conditions in years. Some areas, like California's San Joaquin Valley, face a flood threat, but in general flood-control facilities are adequate to handle the runoff. An exception to "ideal" water forecast: Certain areas of Washington, where snowpacks are as skimpy as 20% of normal.

• **California**—One of greatest water runoff years on record is predicted by Harvey O. Banks, state director of water resources. Compared with 50 year averages, seasonal precipitation is expected to reach 160%, snowpack 140%, six months stream runoff 190%. Reservoir storage is expected to be 125% of 10 year average. Reservoirs on all snowfed streams will fill, it is predicted, and snowmelt runoff will continue later into the summer than normal.

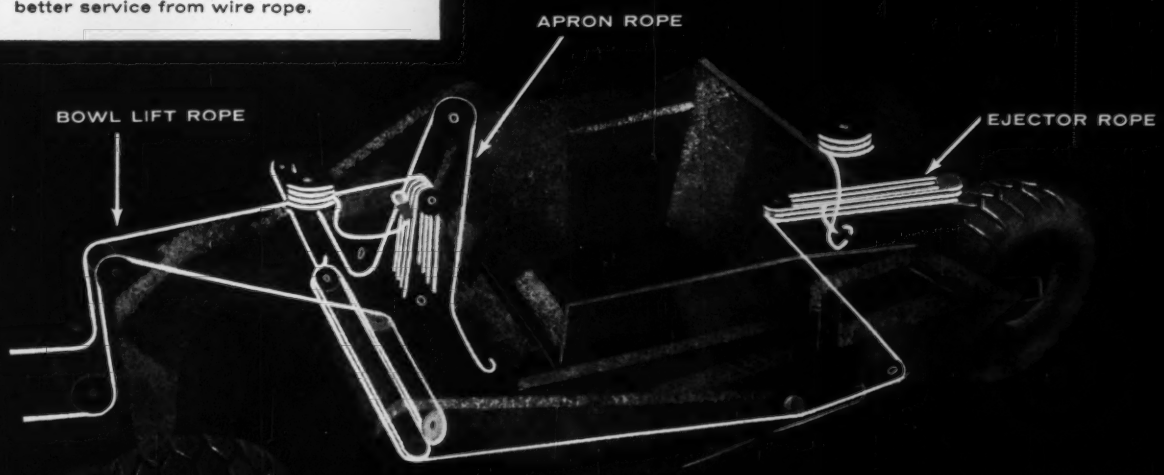
• **Oregon**—Bonneville Power Administration predicts plenty of water where needed, but no floods. For the first time in years BPA had surplus of power in February and March. Runoff flow of Columbia at The Dalles is expected to be 96% of normal.

• **Washington**—Snowpack in the Cedar River watershed, source of Seattle's water supply, is only 20% of normal, while Skagit River, City Light's main power stream, is 69% of normal, according to Soil Conservation Service. Water content of snow draining into Tacoma's Cushman and Nizqually Reservoirs is about the same as last year, while Baker River, one of Puget Sound Power & Light's principal power streams, has greater snowpack than last year. Other streams flowing into Puget Sound have snow packs 64-90% of normal.

• **Colorado**—After five years of drought, Denver Water Board's reservoirs are

ONE OF A SERIES of advertisements to help the construction industry get better service from wire rope.

CARRY TYPE SCRAPER



BOWL LIFT ROPE
6 x 25F PREformed Regular Lay Whyte Strand IWRC
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6 x 25F PREformed Lang Lay Whyte Strand IWRC

Macwhyte Scraper Ropes
can lower your yearly rope costs!

Scraper service needs the best wire rope — and the right rope will cut costs.

For carry-type scrapers, Monarch Whyte Strand 6 x 25F IWRC is the *correct* rope. It is specifically designed for the severest service wire rope can get. The outside wires are big and tough. They provide plenty of surface for abrasion-resistance. The independent wire rope core gives extra crush resistance, while the 199-wire PREformed make-up assures a flexibility that matches the rugged demands of constant heavy service.

The thorough Internal Lubrication of Whyte Strand Wire Rope is a further help in extending service life under severe service. Check these features. They mean longer life — and that means less rope for you to buy!

For helpful information about Wire Rope and its correct use on contractors' equipment, write for your free copy of Bulletin 5702. It's loaded with helpful cost-saving information. 309

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2930 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel, Plastic Coated and Nylon Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

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There's a Macwhyte Distributor near for Quick Service

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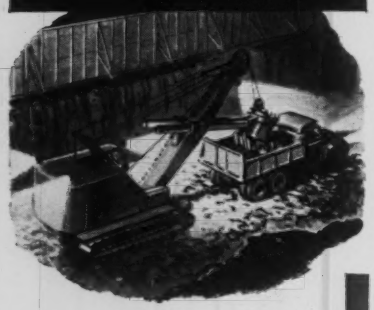


Reliable on-the-job power for floodlights, power tools

Kohler electric plants have won a reputation for smooth running efficiency, low-cost operation. Used on major construction projects the world over. Backed by the 85-year-old Kohler tradition of first quality products. Sizes from 500 watts to 50 KW, gasoline . . . 10 KW to 50 KW, diesel. Write for folder A-43.

KOHLER CO. *Established 1873*
KOHLER, WIS.

Model 5MH21, *5 KW, 115 Volt AC with housing. Manual starting.*

KOHLER OF KOHLER
Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings • Electric Plants • Air-cooled Engines • Precision Controls

full and DWB will dump 7,400 acre-ft of water to provide flood storage. Snowpack on Denver's watershed is 100-115% of normal.

• **Arizona**—For first time since 1941 the two Verde River reservoirs of the Salt River project overflowed. Survey of Salt, Verde, Gila and part of Little Colorado rivers showed stream flow and storage at 93% of 16 year average, and additional runoff capable of bringing it to 160%. Warm weather promises fast runoff, which would avoid repeat of last year's evaporation losses.

In Defense of Drafting

John W. Titus
Structural Engineer

Howard, Needles, Tammen & Bergendoff
Kansas City, Mo.

EDITOR'S NOTE—The following is adapted from an article in the January issue of HNTB NEWS, house organ of one of the nation's biggest consulting firms—one of the largest private employers of engineer-draftsmen in the civil engineering field.

It's a common complaint that the young engineer is required to spend too much of his first years at the drafting board and that advancement to more responsible positions is too slow. But is this complaint justified?

The "typical" engineering graduate entering design work commences his active career by being introduced to the tee square and the triangle. During his next few years he is given the opportunity to become intimately acquainted with these tools. He has met up with these tools in the course of his engineering education, but he still has a lot to learn about the art of preparing engineering drawings. Moreover, his tenure at the board should be recognized—and used—as preparation by the young engineer for responsibilities he will later be expected to assume.

Drafting, for some reason, has fallen into disrepute. It is usually thought of by young engineering graduates as an undesirable drudgery, something that, if possible, should be completely eliminated from engineering work. Yet, it is virtually the only medium by which an engineer can convey his conception of a project. It is to the engineer what a lecture is to the professor, or the sermon to the minister. It represents hours of labor, careful thinking and tedious preparation; it is an integral, inseparable and necessary part of engineering.

A study of our organization over recent years shows that there have always been two engineers engaged in preparing final drawings for each engineer engaged in other phases of engineering. In other words, two-thirds of office engineering time is spent in making the final drawings, regardless of how the organization may be departmentalized.

Since drafting is such a great part of engineering, young engineers should not be disillusioned at the prospect of drafting room experience. A period spent in the drafting room should be accepted as a necessary and valuable part of the young engineer's internship. He should make the most of it.

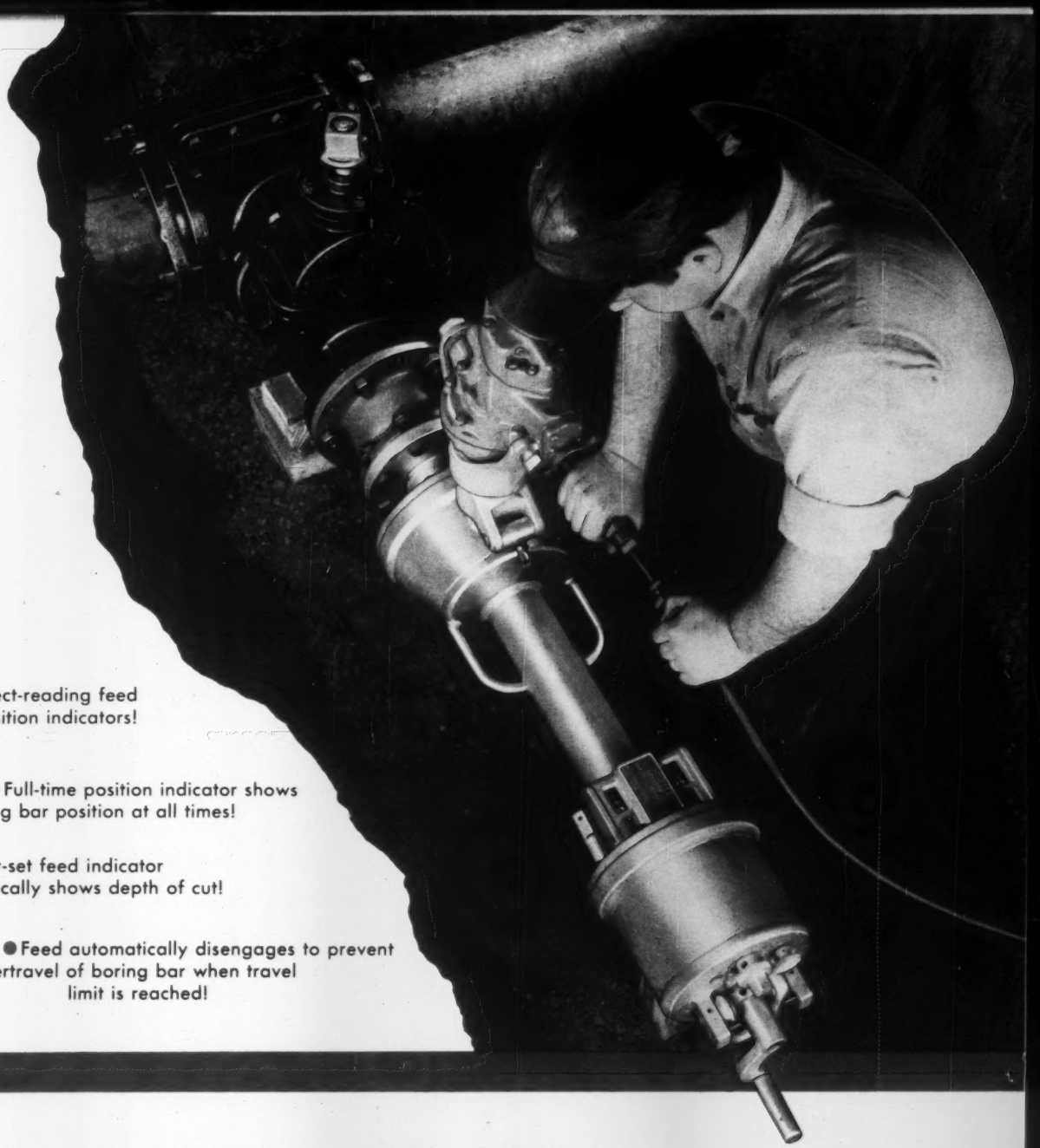
Aside from the technical knowledge he can gain from drafting experience, he should develop personal qualifications which will be required of him in any advanced position. Chief among these perhaps is a sense of responsibility.

The engineer-draftsman is responsible for the accuracy and completeness of his drawing. He should be able to offer and defend a sound basis for every bit of information shown. He should learn to consider an error as a reflection on his thinking ability. He should learn to visualize field conditions and problems so that his drawing will be complete and well arranged for those who will use it. He should consider himself responsible for his work.

Also, the engineer should learn in the drafting room that he is responsible for the situations he creates for others—through the quality of work he performs. He should learn to put himself in the place of his supervisor, employer, contractor, supplier or client. He should realize that his work must fit into the great overall process of constructing a project, or he will be a glaring misfit.

He must learn to think cooperatively as well as creatively. There are those who have excelled in many ways but have not learned to respect the thinking and feeling of others, and as a result have barred the way to their own advancement.

There are always routes of advancement out of the drafting room. The doors are opened regularly, and young engineers therein are invited to advance. And the engineer most likely to be advanced is the one who has assumed his responsibilities to think and act and has made the most of his period of engineering draftsmanship.



- Direct-reading feed and position indicators!
- Full-time position indicator shows boring bar position at all times!
- Easily-set feed indicator automatically shows depth of cut!
- Feed automatically disengages to prevent overtravel of boring bar when travel limit is reached!

Now! automatic cuts up to 12" with the

NEW MUELLER® CL-12

Machine!

New design and new features give automatic operation for faster, safer cuts; more strength for reduced maintenance; simplified operation for use by inexperienced personnel; more compact for easier handling; and standardized tools for simpler tool selection.

MUELLER CO.
DECATUR, ILL.

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario

FORM NO. W-8881

NEW *self-adjusting boring bar packing*

High temperature chevron packing is spring-loaded to insure positive, leakproof sealing without packing adjustments. Line pressure does not enter case.

NEW *rugged all-steel construction*

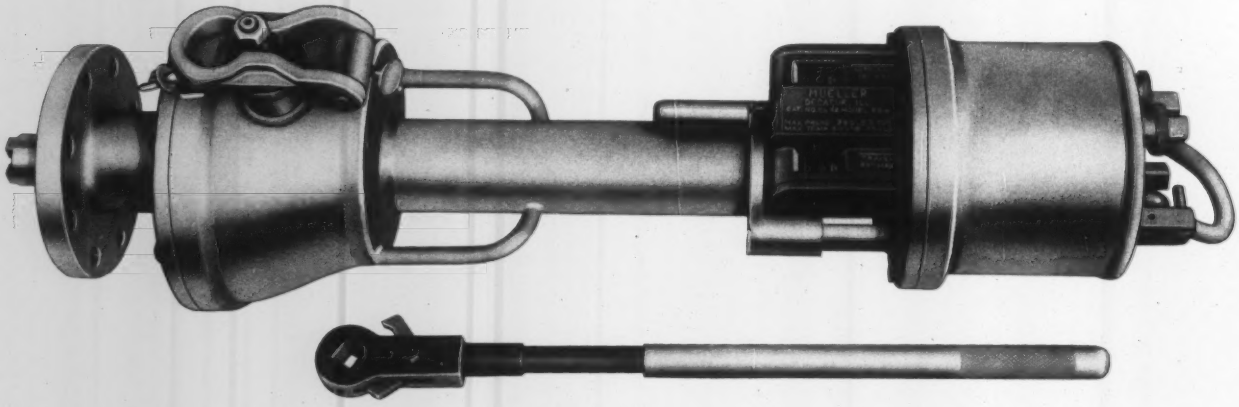
All working parts are totally enclosed in a galvanized steel case to permit complete lubrication and to prevent damage from dirt or other foreign matter and from rough handling. Lubricant is sealed in with "O" rings. Large bearing surfaces assure boring bar rigidity.

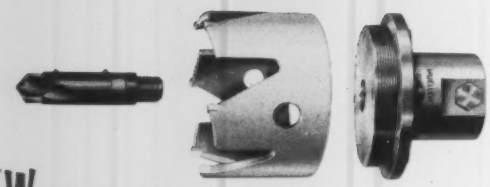
NEW *power or hand operation*

May be hand operated with ratchet handle or power operated with Mueller H-601 Air Motor or Mueller H-602 Gasoline Engine Drive Unit. No changes are required in the machine to use hand or power operation.

NEW *handling ease*

Telescopic design reduces over-all length and weight. Conveniently placed handles and lifting yokes permit easy handling of machine—manually or with hoisting equipment. Front lifting yoke may also be used to lock the boring bar while attaching or removing tools.





NEW *standardized tools*

Tungsten carbide tipped shell cutters are designed for cutting cast iron, cement-lined cast iron, asbestos-cement, reinforced concrete and steel pipe. Tool selection and inventory are greatly reduced. Each shell cutter is specifically designed ½" under the nominal size. This reduces drilling time and travel required and assures perfect cuts. The outside diameter of the cutter is slightly less than the inside diameter of the pipe being cut. Therefore, the cutter makes a complete, clean hole in the side of the main even when making cuts for laterals that are the same size as the main. Cutter hubs for 5½" size shell cutters and larger are of the "E-Z-Release" type. All pilot drills screw into the cutter hub to give greater rigidity and perfect centering. Pilot drill contains a mechanical coupon retaining device. The cutter, hub, pilot drill and coupon can be removed as a unit without first removing coupon.

NEW CL-12 FEATURES

. . . designed to reduce your cutting time!

Now! a new, automatic drilling machine

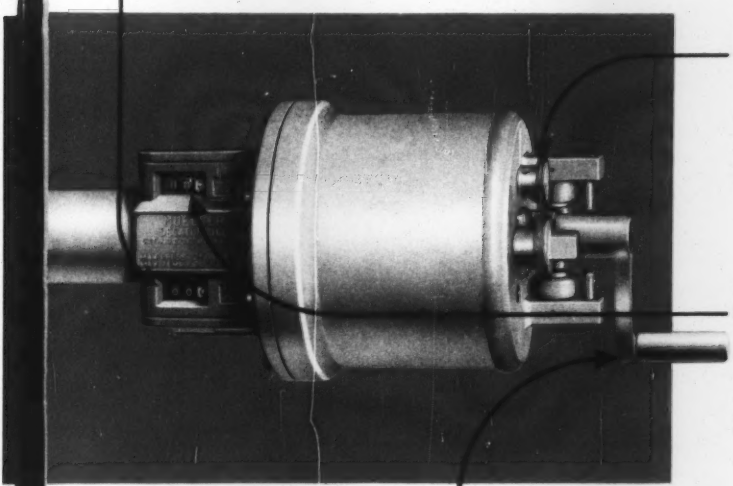
for 2" through 12" cuts in any type of pipe!

NEW *automatic tool position indicator*

Direct-reading indicator shows—at all times—the position of the pilot drill and shell cutter in relation to their fully-retracted or rearmost position. Large numerals read in inches and tenths of an inch and automatically add as the tool is advanced and subtract as the tool is retracted. Eliminates tool position guesswork.

NEW *automatic overtravel protection*

Tool feed is automatically disengaged when the maximum 25" travel of the machine is reached. Damage to the machine is prevented—even when the automatic feed has been set for travel beyond the maximum travel of the machine.



NEW *automatic feed-setting*

The amount of travel required in automatic feed can be quickly and accurately set in inches and tenths of an inch. This amount is clearly shown on the automatic feed travel indicator to insure accurate settings every time.

NEW *automatic feed travel indicator*

As the cut progresses, the direct reading indicator automatically subtracts—always showing the amount of travel remaining in automatic feed. You always know just how much of the cut remains to be made.

NEW *rapid hand travel*

When not cutting, the boring bar may be quickly and easily advanced or retracted by hand. Rapid advancement and retraction of the boring bar reduces time of operation.

NEW *automatic feed disengagement*

When the preset travel in automatic feed is completed and the indicator reads zero, the tool feed is automatically disengaged to prevent damage and loss of time.

Check with your Mueller Representative for complete details.

MUELLER CO. DECATUR, ILL.

specifications

MUELLER CL-12 *drilling machine*

Capacity and Use

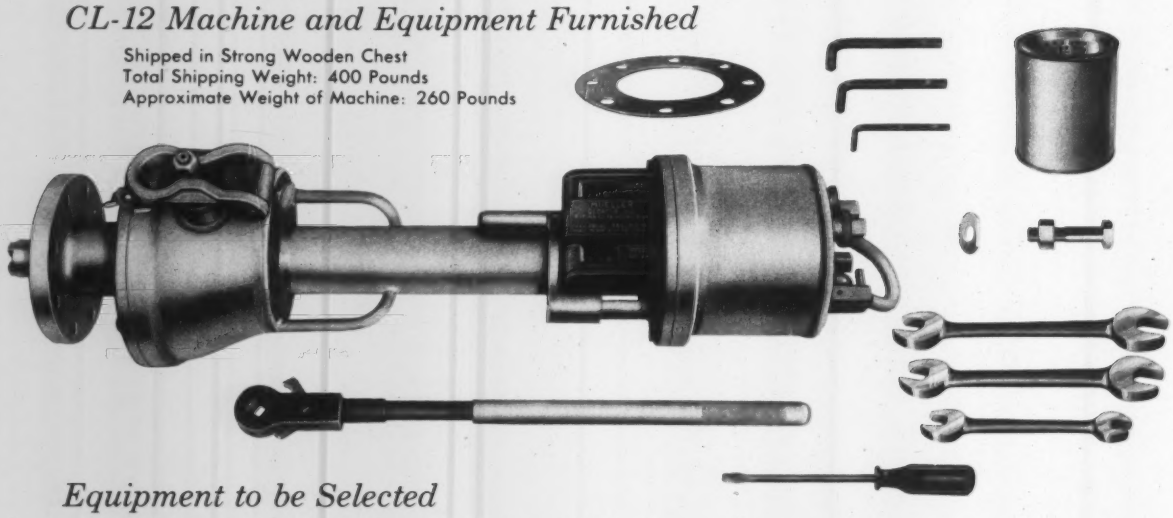
The CL-12 Machine makes cuts from 2" through 12" inclusive in any type of pipe. It is used with tapping sleeves and valves to make lateral connections up to 12" under pressure and to install inserting valves up to 8" in size under pressure.

Working Pressure and Temperature

250 p.s.i. at 100° F.
500° F. at 150 p.s.i.

CL-12 Machine and Equipment Furnished

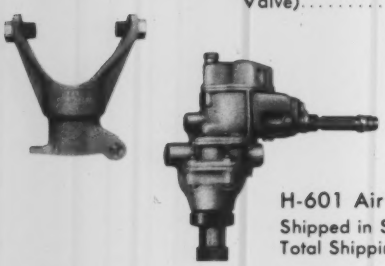
Shipped in Strong Wooden Chest
Total Shipping Weight: 400 Pounds
Approximate Weight of Machine: 260 Pounds



Equipment to be Selected

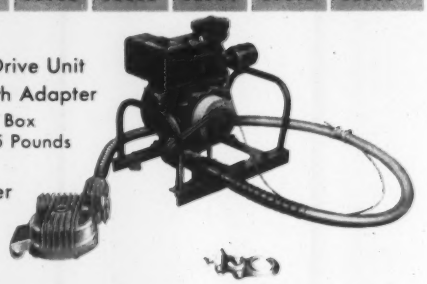
Power Operating Units, Cutting Equipment (cutter, pilot and hub) and Adapters.

	TAPPING VALVES							
Size of valve	2"	2-½"	3"	4"	6"	8"	10"	12"
Size of Drill or Shell Cutter	2"	2"	2-½"	3-½"	5-½"	7-½"	9-½"	11-½"
Drill	64567	64567	....	....	....	....	....	....
Boring Bar Adapter	83666	83666	....	....	....	....	....	....
Shell Cutter	....	....	83617	83203	83134	83135	83140	83141
Cutter Hub	....	....	83599	83671	83673	83676	83679	83682
Pilot Drill	....	....	83634	83634	83639	83675	83678	83681
Machine Adapter (For Mechanical Joint Tapping Valve)*	83668	83669	83367	83368	83369	83370	83371	83372
*Bolts, Nuts and Washers	2 ea. 36445	2 ea. 36445	Furnished with each Mechanical Joint Tapping Valve 3" size and larger.					
Machine Adapter (For Hub End Tapping Valve)	83770	....	83361	83362	83363	83364	83365	83366



H-602 Gasoline Engine Drive Unit with Adapter
Shipped in Strong Wooden Box
Total Shipping Weight: 265 Pounds

H-601 Air Motor Power Unit with Holder
Shipped in Strong Wooden Box
Total Shipping Weight: 95 Pounds



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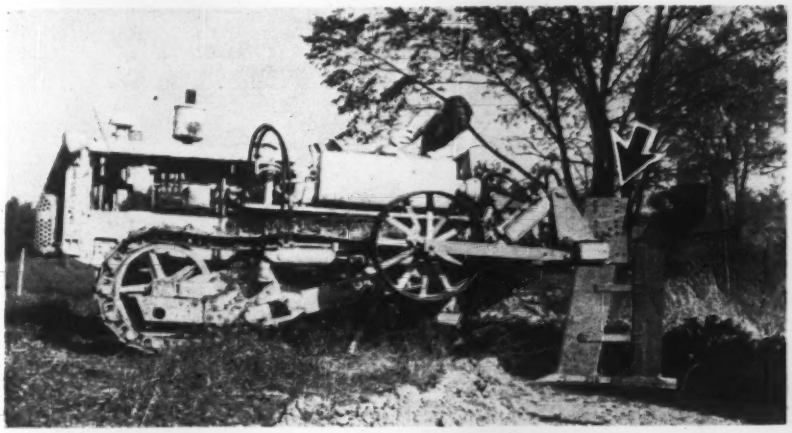
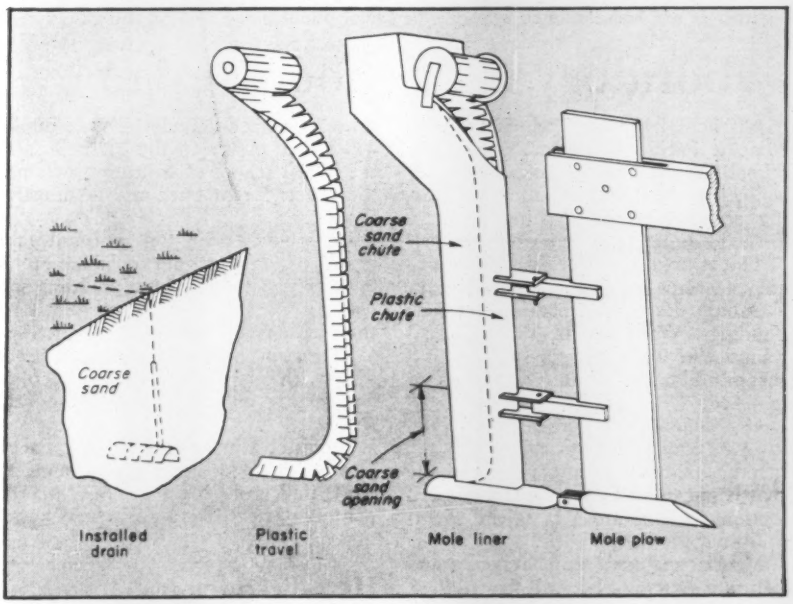


MOLE PLOW attached to a Caterpillar tractor can place plastic drain pipe at the rate of 1½ mph for a cost of seven cents per foot. A 17 lb pull unravels the plastic roll.



VINYL PLASTIC 6 in. wide forms the cavity for subsurface drainage. Sand from the adjoining chute provides a porous area above the drain.

Plastic Soil Pipe Formed By Machine

A tractor-trenching machine that digs trenches for sub-surface drainage systems, forms pipe from a plastic sheet and backfills the hole, is one of the recent developments introduced at the annual Building Research Institute meeting in Washington, D. C., April 21-23. The system, developed by the United States Department of Agriculture, is reported to cut costs to one-quarter those associated with current methods.

The machine consists of a plow and plastic liner pulled by a tractor. Above the liner is a chute for the plastic strip and one for coarse sand.

A roll of vinyl plastic strip .015 in. thick by 6 in. wide is formed into a U shape and fed down through its chute into the trench. As the plastic sheet tapers off the lining mold it remains in the shape of an arch 2 in. wide by 2½ in. high. Coarse sand from the sand chute drops on top of the plastic arch providing a porous passage from plow depth to the drain. The operation advances at 1½ mph.

Cost studies indicate a price of 7 cents per lin foot—of which 4½ cents is for the plastic—should cover the complete operation of placement. The experimental mole plow was designed by the Caterpillar Tractor Co. to be drawn by its D-4 tractor.

Highway Barriers

Traffic expert questions use to halt accidents

Median barriers on heavily traveled metropolitan freeways may not be the whole answer to collision problem on these routes, according to traffic engineer George M. Webb of the California State Division of Highways. Last month he disclosed the results of some preliminary studies that pointed out this fact.

Mr. Webb reported that during a four-year accident analysis covering a section of the San Bernardino Freeway near downtown Los Angeles the fatal accidents were cut in half after installation of a guard rail barrier in the median area—but the injury accident rate more than doubled.

Before installation of the barrier on the above stretch of freeway, there were a total of 167 accidents with 44 of these involving the median strip. Of these accidents, injuries were reported in 70 cases, 23 of them being median area accidents. Two head-on collisions involving the death of three people also were included.

After installation of the guard rail, there were a total of 338 accidents in which 87 involved the median. While only one death occurred after the median was installed, 179 of the accidents involved injuries and 51 of these were accidents involving the guard rail itself.

The study also indicated that increased traffic, far from being an accident promoter, tended to reduce the accident rate. Peak period accident rates were much lower than for light traffic periods. Said Researcher Webb:

"Median barriers may look like the obvious solution to a head on accident problem on freeways with narrow dividers, but the results of such installations thus far have been disappointing in terms of over-all safety.

"For one thing, a positive barrier in a median means that the driver whose car is momentarily out of control has no place to go except into the median or into other traffic lanes; and the driver who wants to evade an imminent crash has no room to maneuver."

(*Research continued on page 70*)

Famous Builders CANNOT Make Mistakes

Famous Barr Dept. Store St. Louis, Mo.	Owens-Corning Fiberglas Plant Kansas City, Mo.
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● One mistake can ruin any famous builder's reputation. That's why he so carefully plans and checks every detail.

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Can you use IRONITE? Probably. Write for Pamphlet No. 701 to IRONITE COMPANY, Suite 729, 208 South LaSalle Street Building, Chicago 4, Illinois.

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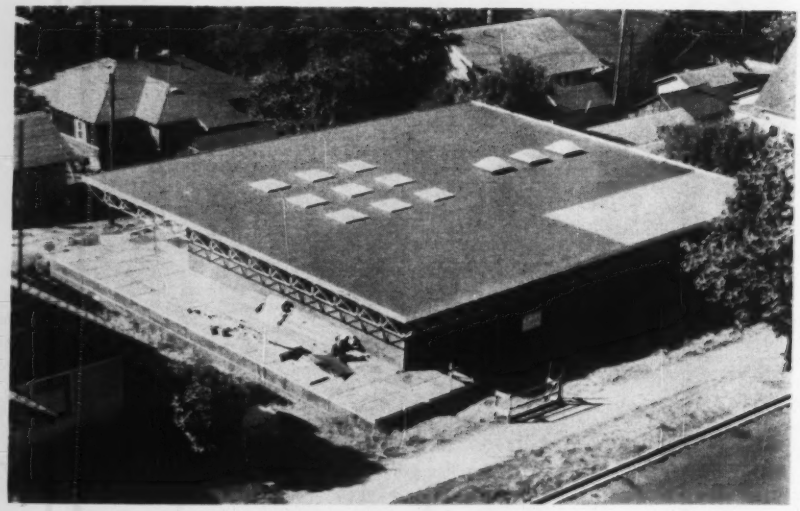


NOVEL SCHOOLHOUSE has movable walls, windows and partitions and two lighting systems. It will house research activities for school planning and construction.

Laboratory for School Design

A school laboratory, which will become a Pacific Northwest center for school planning and construction studies by architects and educators, is nearing completion at Washington State College, Pullman, Wash.

The structure has many interchangeable features for experimentation in classroom design and planning of new buildings. Walls can be shifted, classrooms can be changed in size and shape, and windows can be moved or removed.

The laboratory is constructed of preformed framing sections that are bolted together. Walls clip into place and the roof is put down in tongue-and-grooved sections. Floors are 4 ft square sheets of heavy plywood.

Various materials, color schemes and lighting systems also will be studied. One of the classrooms has a dark glass for windows that cuts out about 88% of the light from the outside. Fluorescent lighting of about three times the intensity of normal classroom lighting standards will be used in this room. In another classroom ordinary glass is used with normal lighting and selective glass skylights.

Much of the material for the building was donated. The building is expected to cost the college only $16,000 as compared with up to $70,000 if all of the materials had been purchased. Architectural and mechanical engineering students have provided labor to erect the building, and students also will make all changes.

WSC officials point out that the laboratory isn't going to be an "ivory tower" project. Grade school pupils will attend classes in the building, and the WSC school of education will use the rooms for practice and demonstration classes.

Robert P. Darlington, assistant professor of architectural engineering is in charge of the school building research project. It is sponsored jointly by the division of industrial research of Washington State Institute of Technology, the department of architectural engineering and the school of education.

Professor Darlington and his associates will use the flexible classrooms to work out problems that arise in the planning of new regional school buildings.

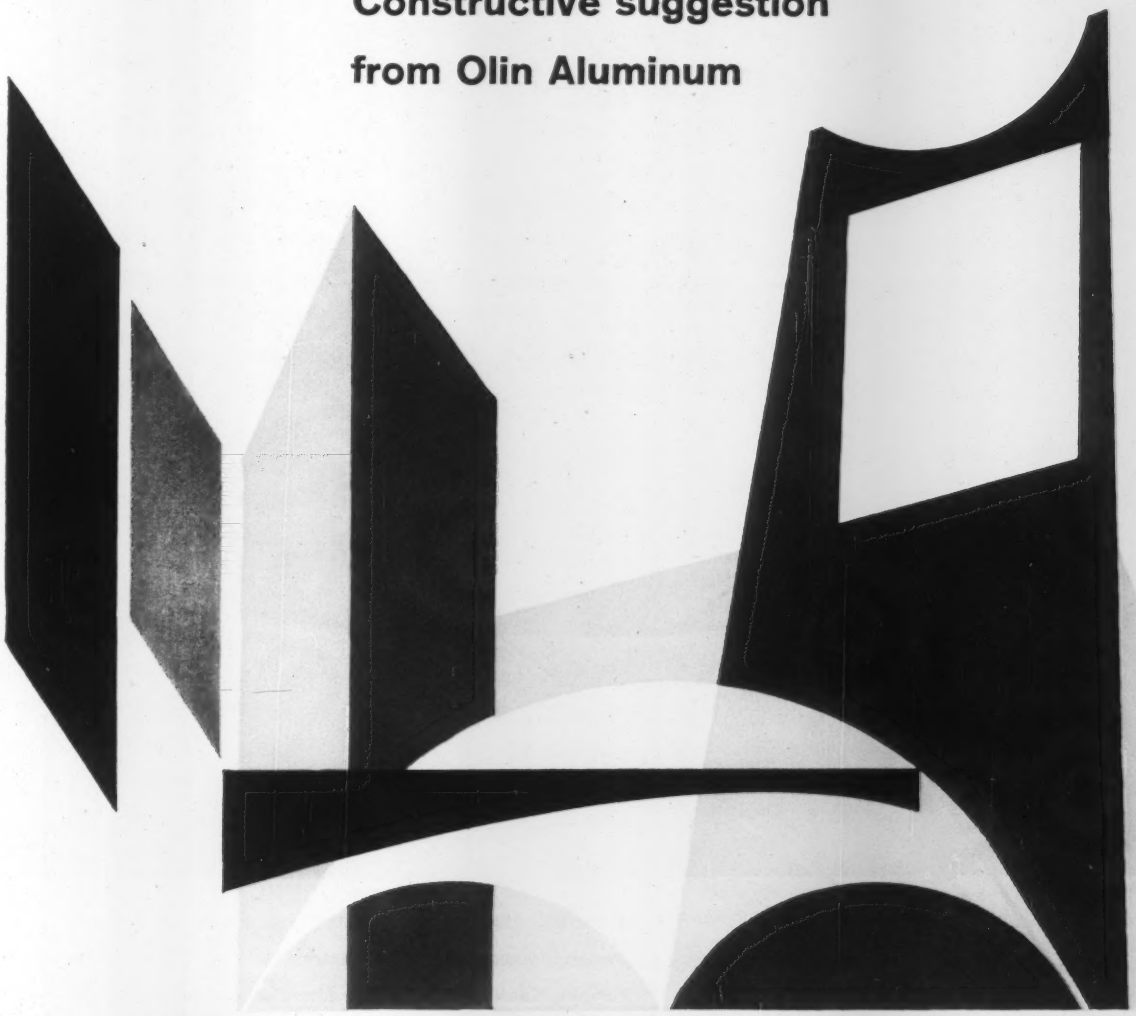
High-Frequency Vibrations Weld Metals in Few Seconds

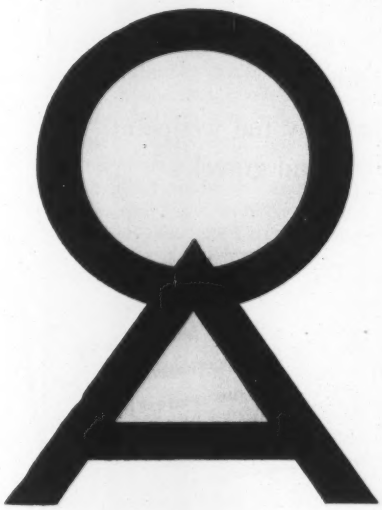
Metals now can be welded without externally applied heat, fluxes, solders or filler metals.

Ultrasonic welding—a process that joins metals and metal alloys by applying high-frequency vibrations to the metals—was described in the March issue of *Welding Research* by J. Byron Jones and Florence R. Meyer of Aeroprojects Inc., West Chester, Pa. This type of welding produces a strong bond without the resulting external deformation that characterizes pressure welding and without the cast-metal zones associated with resistance welding, the authors claim.

The metals to be joined are clamped at low static pressure between welding

Constructive suggestion from Olin Aluminum





Whatever you're designing, building or fabricating, make this mental note: As time goes on, Olin Aluminum will become an increasingly important source of new ideas for you. Olin is the new major producer of aluminum—offering technical services that can help you translate new ideas into metal.

For information and technical service, write: Aluminum Division, Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, New York—Integrated Producer of aluminum pig, ingot, billet, sheet, plate, extrusions, rod and bar, pipe and tubing, electrical conductor.

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Symbol of New Standards of Quality and Service in the Aluminum Industry

ON THE BANKS OF THE WABASH THE WORLD'S LARGEST ELECTRIC GENERATING UNIT IS BEING CONSTRUCTED "IN THE DRY"...

Breed Electric Generating Station near Fairbanks, Indiana
Owner: Indiana & Michigan Electric Company, Fort Wayne, Indiana
Pumping Contractor: American Dewatering Corporation, New York

MORETRENCH WELLPOINT EQUIPMENT, pumping steadily, keeps 38′ of water under careful control at Breed Plant while construction speeds ahead in dry material.

During recent flood stage, a 52′ head of water was held in check by the wellpoint system, necessitating pumping 22,000 GPM. Material is coarse sand and gravel.

When finished, the Breed Plant will be the world's largest single generating unit with a capacity of 450,000 KW.

A large power plant—or a small sewer—it makes no difference. If it's wet, we're interested in helping you plan for efficient, economical construction—IN THE DRY. Call our nearest office for a *realistic* estimate on your requirements.

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Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington
Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario
Brazilian Representative: Oscar Taves & Co., Ltd., Rio de Janeiro

tips and high-frequency vibrations are applied for a few seconds. The intensive vibrations actually disrupt and cause two surfaces to intermingle, thus establishing a complete solid-phase metallurgical structure between the metals.

Ultrasonic welding is reported to achieve the same order of weld strength as does pressure welding without some of the disadvantages of pressure welding—particularly the need for meticulous cleaning prior to and the excessive deformation after joining. Surface cleaning in preparation for ultrasonic welding on an Alclad aluminum surface, for example, requires only degreasing; bare aluminum alloys require only one deoxidizing operation and the time elapsing between cleaning and welding is brief.

Other advantages that distinguish ultrasonic from ordinary welding methods include welding in shorter time; with inconsequential deformation (less than 5% instead of the usual 60 to 80%); and with lower applied static force. Ultrasonic spot-type welds can be made to overlap and critical edge distance and row spacing is believed to be less than for resistance spot welds.

Development of this process stemmed from experiments conducted for the Bureau of Aeronautics, Department of the Navy. Original experiments were intended to find ways of simplifying cleaning of materials prior to standard spot welding; ultrasonics were considered for the job. However, it was soon noticed that when high-frequency vibrations were applied to a pair of metal sheets they would frequently stick together without requiring further application of electric welding current.

Subsequent developments in ultrasonic equipment and techniques extended the range of weldable materials and material thicknesses. Successful welds have been produced in a variety of aluminum alloys and stainless steels, in nickel, brass, copper and in dissimilar metal conbinations.

In addition to achieving basic ultrasonic spot-type welds, equipment also has been developed to produce continuous seam-type welds.

Equipment for an ultrasonic welding system consists basically of an electronic device for generating alternating-current power at the desired frequency; a welding array for converting the high-frequency ac power into elastic vibratory energy and for delivering this power into the weld zone; and auxiliary equipment for applying static load to the workpieces and for controlling the duration of the ultrasonic pulse in spot-type welding or the rate of continuous welding.

New Way To Finish CONCRETE CEILINGS

More and more building specifications require finely finished concrete ceilings. Because of this new requirement, Stow Manufacturing Company has developed the Stow CG Ceiling Grinder—a special machine designed to grind off form marks and fins, cut off nails, and smooth the entire surface.

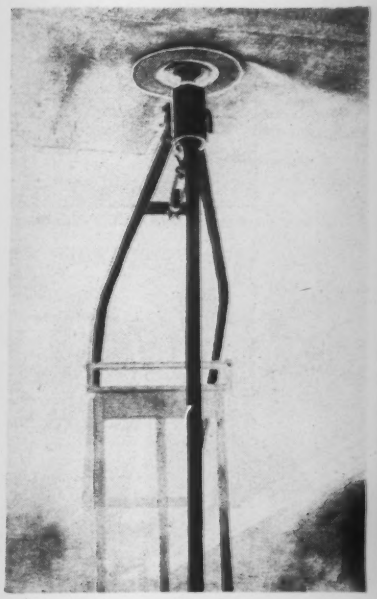
With this machine, one man can average 4,000 square feet per day. Simple to operate, it pushes along like a baby carriage.

To operate the Stow Ceiling Grinder: (A) The operator first sets the pivot arm at about a 45° angle. He then adjusts the grinding disc to proper height by lifting up on the rubber-gripped handle in the center. A ratchet arrangement automatically locks it in position at the height desired. (B) A slight pressure is exerted on the grinding disc by the spring and chain assembly at the opposite end of the pivot arm. (C) A turn-buckle is used to get the most desirable angle for grinding. For ordinary grinding, the disc should be flat against the ceiling, but for cutting nails and removing fins it works better at a slight angle. A spring arrangement is built into the bearing housing to support the grinding disc and absorb any shocks, thus preventing any gouging. Once the machine is adjusted, the operator just pushes it along.

Three models are available:

CG 10—for ceilings 8 to 10 ft. high
CG 13—for ceilings 10 to 13 ft. high
CG 16—for ceilings 13 to 16 ft. high

STOW CG CEILING GRINDER



FOG OF CONCRETE DUST

All three models have a 1 HP totally enclosed motor operating at 3450 RPM. The disc is a 9" Bayflex of cotton fibrous material with a silicon carbide abrasive bonded with resin.

The Stow CG Ceiling Grinder can also be used for grinding walls. For this type work, employ the same flexible shaft as used on the ceilings, but attach a handpiece or anglehead to one end.

Stow Manufacturing Company also makes a complete line of portable electric flexible shaft grinders for both wet rubbing and dry grinding walls. For more information on the Stow CG Ceiling Grinder and a copy of Stow's Grinding Concrete pamphlet, which gives the proper speeds for both wet rubbing and dry grinding, contact your Stow distributor or send in the coupon below. Stow Manufacturing Company, Binghamton, N. Y., also makes a complete line of concrete vibrators, rotary trowels and screeds.

STOW MANUFACTURING CO.
19 Shear St., Binghamton, N. Y.
Please send me Bulletin 5713 on CG Ceiling Grinders.

Name ..... Title .....
Company .....
Street .....
City ..... State .....

won't

"RECKON WE'LL HAFTA CUT YORE WHISKERS LOOSE, PAW... THESE TYTON JOINTS IS TIGHTER'N GRAN'MAW'S CORSET."

U.S. cast iron PIPE

FOR WATER, SEWERAGE AND

let go!

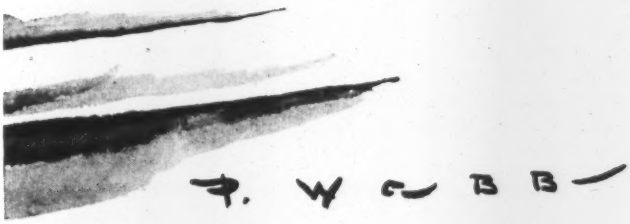
Grandpaw's whiskers are proof! Tyton Joint® pipe seals permanently and bottle-tight.

It's easy to assemble, too. A specially designed rubber gasket fits into the bell of the receiving pipe. When the connecting pipe slides into place the gasket is compressed and presto!... a perfect fit! No bell holes, no caulking, no nuts or bolts to fasten. Even green crews look expert in handling it. Tyton Joint pipe doesn't mind the weather, either. You can lay it in rain or a wet trench when you have to.

Call or write today and get *all* the facts about Tyton Joint pipe. Facts that can save you money, time and trouble.

U. S. PIPE AND FOUNDRY COMPANY
General Office: Birmingham 2, Alabama

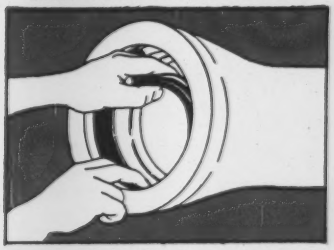
A WHOLLY INTEGRATED PRODUCER FROM MINES AND BLAST FURNACES TO FINISHED PIPE



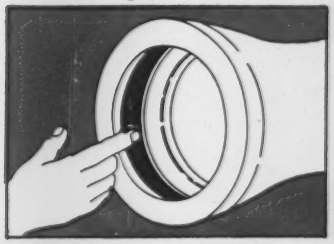
INDUSTRIAL SERVICE CAST IRON

U. S. TYTON JOINT

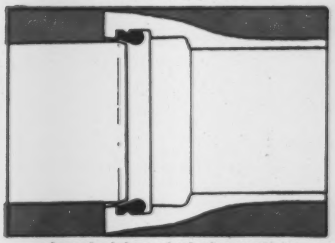
ONLY FOUR SIMPLE ACTIONS



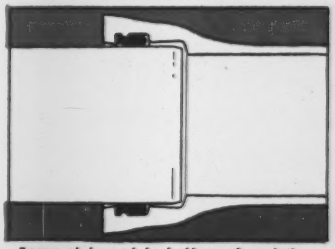
Insert gasket with groove over bead in gasket seat



Wipe a film of special lubricant over inside of gasket

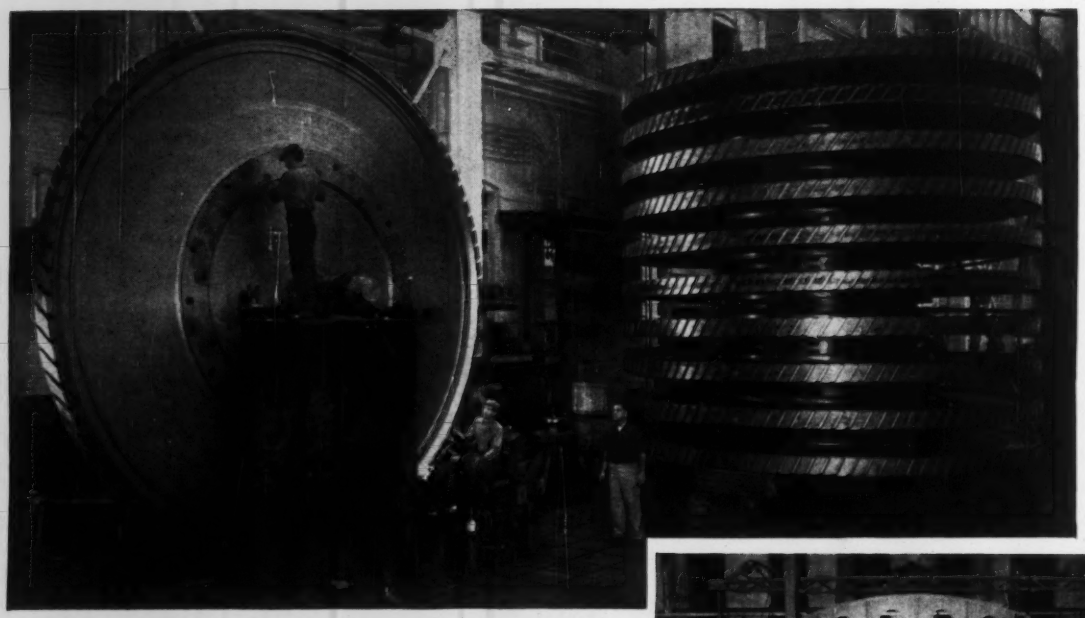


Insert plain end of pipe until it contacts gasket

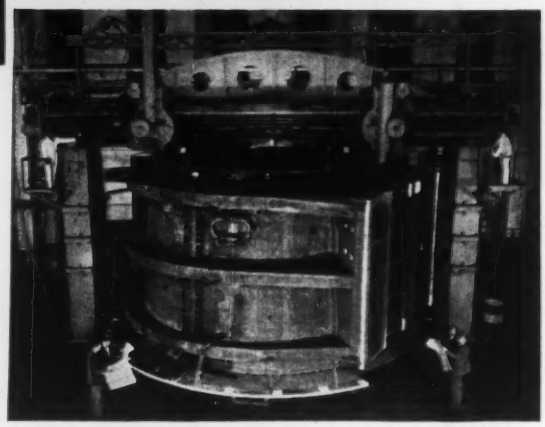


Force plain end to bottom of socket... the job's done!

12" Tyton Joint pipe for water line in Florida



Rotor discs for mammoth 11-stage compressor were balanced and stacked for alignment in one of Newport News' five huge machine shops. Large engineering and technical staffs with a vast plant make Newport News an ideal source for large equipment . . . *standard or special in design.*



A 35-foot boring mill in Newport News' plant machining the 374,000-pound upstream housing for the giant axial flow compressor. The compressor is heart of an 8-foot supersonic wind tunnel at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics at Moffett Field, Calif.

To create winds exceeding

2000 MPH

Newport News builds world's Mightiest Compressor

Whenever you want large units built with careful attention to detail, give the job to Newport News.

This company recently built an eleven-stage axial flow compressor that shatters all previous records for wind force . . . using what is believed to be the world's largest rotating object.

The rotor, weighing more than 400 tons, comprises eleven huge discs. Each disc, machined from a 96,000-pound forging, was finished to a 50,000-pound wheel and balanced to within 26 ounces at the rim. In each rim, slots for blades were machined to within .005″ on special milling heads designed and produced in the Newport News plant.

Here at Newport News, you'll find more than large productive capacity. In machine shops, foundries and forging plants Newport News craftsmen complete your orders with specialized techniques backed by experience in fabricating thousands of products.

Newport News' craftsmen produce units that range from small components of spinning machines, to mammoth hydraulic turbines . . . from piping, pumps and valves, to vacuum tanks, digesters and bridge caissons.

These skilled men handle the job exactly as you want it done, for maximum results per dollar invested. So let us bid on your present or future projects. Learn how Newport News can help you. Send for our illustrated booklet entitled, "Facilities and products" . . . it's your for the asking.

Newport News

Shipbuilding and Dry Dock Company

Newport News, Virginia

"PIPE TRAIN" is readied for practice trip into small bore tunnel. Hydraulic jacks and cable to support pipe are mounted on locomotive unit and at center of each carrying section. The train can support a 32 ft long pipe section with each haul.

Midget Train Hauls Pipe In Tight Tunnel

By designing and building a miniature train to haul pipe, a contractor was able to place a 26 in. OD concrete pipeline in a 40 in. wide space in a tunnel.

The $3,000 haul train is being used at Santa Cruz, Calif., where Valley Engineers, Inc., Fresno, has a $200,000 contract to lay 3,400 ft of pipe for a sewage collection system. The job involves replacing an existing 16 in. pipe with a 21 in. line (26 in. OD). The new pipe is being laid on a shelf 40 in. wide by 30 in. high. The 6 ft wide, 8½ ft high tunnel also contains a second 30 in. pipe—used to deposit sewage into the ocean.

Because there was no space to spare, the train was a necessity, according to the project contractor's manager Ted Nielsen.

The train comprises two carrying sections and a locomotive powered by a 10 hp gasoline engine. It is 14 ft long but extends to carry a 32 ft long pipe section. Since all three sections of the train are separate, it is the pipe which ties the train together.

In loading, pipe is placed between the tracks, the unit is driven over it and steel cables are placed and fastened manually under the pipe. Then the pipe is picked up by hydraulic jacks—one mounted on each carrier and the locomotive – which also tighten the cable. An operator rides the train at all times.

Accumulation of carbon monoxide gas is prevented by exhaust fans that keep the air moving through the narrow tunnel.

Nine lengths of pipe or 288 ft are being installed daily, with an 11 man crew working a single 10 hour shift, five days a week.

The train was first used to take 4 by 6 in. wooden track into the tunnel and haul out muck in a skip.

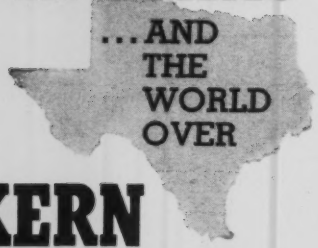
Company officials say the train—capable of carrying pipe up to 28 in. dia—can also be used in mines and for other underground work.

The train was designed by Mr. Nielsen and Thomas Flynn of Valley Engineers, and constructed in the company's plant in Fresno.

(Field & Office continued on page 78)

CLOSE QUARTERS—A 40 in. space is available for second sewer in 6x8½ ft tunnel.

*IN TEXAS

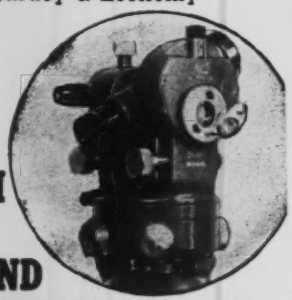


...AND THE WORLD OVER

KERN
SURVEYING INSTRUMENTS

*The Bridge Division of the State of Texas Highway Dept. uses Kern Instruments

WORLD FAMOUS FOR
Working Speed
Operational Simplicity
Accuracy & Economy



DKMI TEN SECOND THEODOLITE *(with optical micrometer)*

- Exceptional portability and precision.
- Readings automatically ... AT A GLANCE.
- Direct reading to 10". Estimation to 1". Average working accuracy —3-4 secs.
- Can be used with electric lighting unit for night work.

KERN CENTERING TRIPOD

Unique—a Kern first! Centers instruments in seconds with remarkable accuracy. Assures exceptional stability with ball-and-socket head, supporting instrument coupling.

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Write for Brochure DK 518-1

PROMPT, RELIABLE SERVICE
FACTORY TRAINED PERSONNEL

Kern SWISS

The FINEST in SURVEYING EQUIPMENT

KERN INSTRUMENTS INC.
120 Grand St., White Plains, N.Y.

Steel erection is touchy when . . .

Beams Pick Up Four-Story Load

In remodeling an existing building in downtown Los Angeles, the Union Bank wanted a clear-span first floor area. That meant removal of seven interior concrete columns supporting upper floors of the five-story building.

The column loads were taken by 5½ ft deep, 50 ft long steel girders that were threaded into place by a pair of fork-lift trucks. But before that could be done, new columns at the side walls had to be erected to support the girders that were to take the center loads. These new concrete columns extend to footings 30 ft below the existing basement floor. This meant fourteen 30 ft deep holes had to be dug by hand.

Existing center concrete girders were shored by steel columns from the basement level. This permitted the existing center concrete column to be cut out. Then a plate girder was threaded across the 50 ft width of the building and placed perpendicular to the existing concrete girders, on the new side columns. This operation was done in a series, shoring two columns at a time and setting two plate girders.

After the girder was set and welded at each side, tapered steel shim plates, 2x6x36 in., were pressure-jacked between the new steel girder and the existing center concrete girder. This picked up the load of the existing building columns above.

During the operation, and for 72 hours after, continuous readings were taken for deflections of the steel girder, as well as the slabs above. Settling of the new concrete columns was also checked. When the engineers were assured that all the load of the existing building was properly transferred to the new girder and columns, the temporary shoring columns were removed and operations began on the next series.

Working out this plan for the bank were Claud Beelman, architect, and Brandow & Johnston, structural engineers. Contractor was Chotiner & Gumbiner.

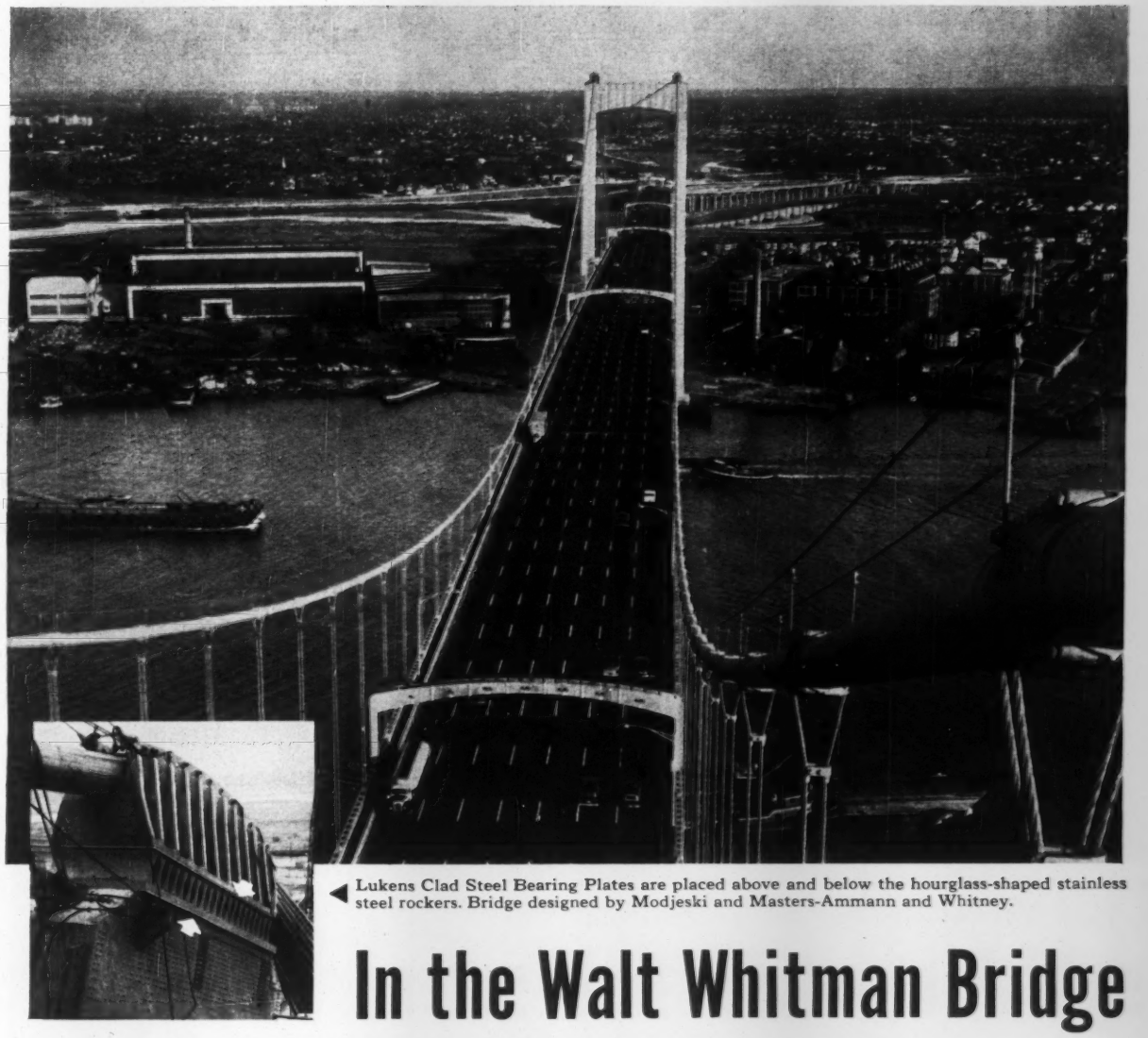
Pipeline Fabricated Within Walkway of Concrete Bridge

Esthetic considerations prompted the city council of Brisbane, Australia, to refuse permission to lay a 12 in. gas main beneath or beside the handsome reinforced concrete Ekibin Bridge. So the South Brisbane Gas & Light Co. came up with a novel and acceptable solution.

It was decided to lay a rectangular section—17½ by 6½ in. to equal the cross-sectional area of a 12 in. dia pipe —in the small footpath space. The path was formed in the concrete, 10 in. deep at the handrail side tapering to 8 in. at the curb.

Using ¼ in. continuously welded steel plate in 36 ft lengths, the gas main was constructed. The units were aligned, welded and tested with air at 15 psi. The main was lowered into position on the bridge and coated with tar. Then the entire line was covered with asphaltic concrete.

(Field & Office continued on page 80)



◀ Lukens Clad Steel Bearing Plates are placed above and below the hourglass-shaped stainless steel rockers. Bridge designed by Modjeski and Masters-Ammann and Whitney.

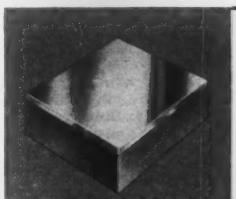
In the Walt Whitman Bridge

LUKENS CLAD STEEL BEARING PLATES PROVIDE PROTECTION OF STAINLESS...PLUS ECONOMY!

Vitally important cable-anchorage bearing plates of the new Walt Whitman Bridge get enduring safety from stainless steel. Use of this corrosion-resistant material assures free bearing movement and cuts costly maintenance to a minimum. And because the designers specified Clad Steel Bearing Plates, they achieved this protection at a considerable savings over the cost of solid stainless.

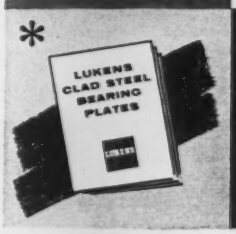
In order to meet varying design demands—particularly with regard to strength—two types of Lukens Clad Steel Bearing Plates are available. The standard type provides a minimum yield of 30,000 psi. A higher strength plate—incorporating A-302, Grade B backing steel for use in larger bridges—will meet a 50,000 psi minimum yield requirement. And all bearing plates can be supplied flattened and machined on both sides to within .010 inch of dead flat.

✻ **For information you can use,** *write to Manager, Marketing Service, 157 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania. Be sure to ask for special bulletin 180.*



LUKENS clad steel is a solid plate—one surface corrosion-resistant metal permanently bonded over all to a rugged, yet economical backing steel.

✻

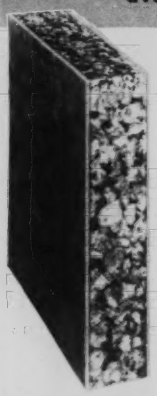


LUKENS ®

SERVICISED

JOINT FILLERS
for Concrete Paving

Three widely used Servicised Premolded Joint Fillers are briefly described below. Complete details, specifications and samples of any particular type or types are available on request.



KORK-PAK®

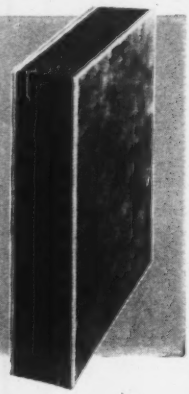
An exclusive Servicised development KORK-PAK consists of asphalt and granulated cork formed between two sheets of asphalt saturated paper.

advantages

1. It is non-extruding
2. Recovers more than 80% of original thickness after compression
3. Low moisture absorption
4. Readily handled without breakage
5. Least expensive non-extruding type

recommended uses A general purpose joint filler, particularly for highway work where the top of the joint can be thoroughly sealed with Para-Plastic.

ASPHALT



A composition of asphalt, vegetable fibre and a small percentage of finely divided mineral filler, formed between two sheets of asphalt saturated paper.

advantages

1. Forms an easily compressible cushion
2. Is highly waterproof
3. Low in cost

recommended uses For interior concrete floor construction where black color is not objectionable, and most extensively in the formation of contraction joints in concrete construction where a ¼" or ⅜" thickness is often used.

FIBER

Cane Fiber Joint Filler is a non-extruding, resilient bituminous material consisting of cellular cane fibers securely bound together and uniformly saturated with a suitable bituminous binder.

advantages

1. It is non-extruding
2. Ordinary carpenter saw can be used for cutting
3. Lowest cost non-extruding type
4. Recovers more than 70% of original thickness after compression

recommended uses

An all-purpose joint filler extensively used for highway work where the upper portion of the joint can be thoroughly sealed with Para-Plastic Bituminous Rubber sealing compound. The complete line of Servicised Joint Fillers is described in the Servicised Catalog. Write for your copy.

SERVICISED PRODUCTS
CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

Pump Houses Hidden In Residential Area

To preserve the appearance of residential neighborhoods in Owensboro, Ky., six deep water supply wells needed in these areas were drilled in the middle of streets and housed in underground chambers. Quiet operation was assured by use of submersible pumps.

The pump pits are accessible through ordinary manholes. Starters and automatic controls are mounted on telephone poles. Pump motors are controlled through telephone wires from a central point in the city.

Pumps are 20 hp Type H submersible type supplied by Byron Jackson Pumps, Inc. Black & Veatch, Kansas City, Mo., were the consultants and Elmer Smith is superintendent of the Owensboro Municipal Utilities Department.

Engineers Seed Dredgings To Protect Town From Dust

To keep sand from blowing into homes and piling up in the streets of Palmyra, N. J., the Corps of Engineers is seeding 90 acres of silt and sand along the Delaware River. Workmen are sowing a specially prepared mixture of oats, pasture grass and clover seeds on river dredging that was dumped ashore when the Corps deepened the ship channel to 40 ft.

The sand dried out and high winds whipped it into the nearby community, forming dunes several feet high. Experts studying the problem recommended the sowing of this seed mixture in an effort to provide growth that will hold the fine material in place.

(*Field & Office continued on page 84*)

"TRACM" MOUNTING

"TRUCM" MOUNTING

OUTSTANDING PERFORMANCE

On job after job, Ingersoll-Rand Drillmasters are sinking 200 ft or more of 6-inch blast holes per day. Not just occasionally, but day after day on a routine production basis. That's why so many users have hailed the Drillmaster as the most productive blast hole drilling unit ever developed.

Completely self-powered and self-propelled, the Drillmaster meets every drilling requirement. Use it with the I-R down-the-hole drill, or as a rotary drill. In any type of ground, Drillmaster performance is its own best recommendation.

AND VERSATILITY TOO

In addition to the complete crawler-mounted Drillmaster, you can also obtain the basic Drillmaster and compressor unit for mounting on your own tractor or truck. The "TRACM" mounting is ideal on rough terrain — takes your Drillmaster anywhere a tractor can go. The "TRUCM" mounting saves time, effort and expense on jobs of short duration. For complete information, send today for Drillmaster Bulletin No. 4179.

A Constant Standard of Quality in everything you need for drilling rock

Ingersoll-Rand

5-696 11 Broadway, New York 4, N. Y.

COMPRESSORS • HYDRA-BOOMS • WAGON-DRILLS • CRAWL-IR • DRIFTERS • JACKHAMERS

INTERNATIONAL model RDF-230-H six-wheeler. Gross vehicle weight 60,000 lbs. Gross combination weight 90,000 lbs. High-torque HR-6 Cummins 175 hp. diesel engine; other diesel options to 250 hp. Extra-heavy-duty front end. True geometric power steering. Heat treated alloy double channel frames. One of many six-wheelers and all-wheel drive models from the world's most complete truck line.

Need 'em rugged?

INTERNATIONAL Trucks are ready for anything—built to handle the big loads with ease. They're specialized on the manufacturing line to *keep* off-highway operations on the move.

Extra-heavy components shrug off brutal load punishment. Low-cost diesel power pulls through the heaviest going with profit-making fuel economy. What's more, *these* heavy-duty diesels are backed up by a power train that matches engine, truck, load weights and job exactly.

The result: You put more money in the bank because you haul extra-weight loads with less on-the-job cost and work-stopping downtime.

Your drivers will like them and you'll like them. See your INTERNATIONAL Dealer now. He's ready to help you choose the right truck for your job . . . the truck that costs *least* to own!*

**Signed statements in our files, from fleet operators throughout the U.S., back up this statement.*

INTERNATIONAL TRUCKS

Conventional trucks: INTERNATIONAL model A-182 with four-yard dump body, 141-in. w.b., 308 cu. in. engine, 16,000 lbs. two-speed rear axle, heavy-duty springs, double oversize brakes, 9.00 x 20 10-ply tires. 21,000 lbs. GVW.

INTERNATIONAL model A-164 with four-yard dump body, 129-in. w.b., 264 cu. in. engine, 15,000 lbs. two-speed rear axle, heavy-duty springs, oversize brakes, 8.25 x 20 10-ply tires. 19,000 lbs. GVW.

Cab-forward trucks: INTERNATIONAL model ACF-182 with eight-yard dump body, 149-in. w.b., 308 cu. in. engine, 28,000 lbs. tandem drive rear axle, oversize standard brakes, 9.00 x 20 10-ply tires. 33,000 lbs. GVW.

INTERNATIONAL model AC-1892 with five-yard dump body, 137-in. w.b., 308 cu. in. engine, five-speed, constant-mesh transmission, 18,500 lbs. two-speed rear axle, oversize brakes, 10.00 x 20 10-ply tires, 25,500 lbs. GVW.

Need 'em now?

Four Heavy-Duty models are ready now for immediate delivery! Call your INTERNATIONAL Dealer—for delivery from the INTERNATIONAL *Truck Factory Inventory Pool.*

Choose from conventional or cab-forward models complete with bodies, hoists, frame reinforcements, tow hooks, front directional signals, rear view mirrors both sides, heater-defrosters and oil filter.

To meet your specific requirements you can have any or all the following optional equipment installed in a matter of hours: cab protectors, extension sides, swinging partitions and spreader aprons.

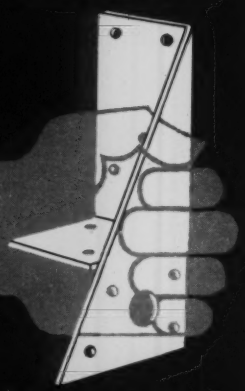
Keep your job moving on schedule with INTERNATIONAL Trucks—first in six-wheel and heavy-duty truck sales for over 23 years.

cost least to own!

INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

For 'Shear' HOLDING POWER



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Trip-L-Grip
FRAMING ANCHORS

For Stronger, more Economical timber framing for

- RAFTERS TO PURLINS
- JOISTS TO HEADERS
- RAFTERS TO PLATE
- STUDS TO PLATE

Send today for data to properly frame nailed wood joints

NEW

CLIP COUPON for FREE Trip-L-Grip BOOKLET

TIMBER ENGINEERING COMPANY
1319 18th Street, N.W., Washington 6, D. C.
Please send new booklet, "16 Uses and Design Data for Trip-L-Grip Framing Anchors."
Name.....
Firm.....
Street.....
City.....State.....
ENR-585

Computer Prints Out Pier Bent Design Loads by AASHO Groups

Rigid frame pier bents used for highway bridges and grade separations are now being analyzed in an electronic computer completely in accordance with AASHO requirements by King & Gavaris, New York City consulting engineers.

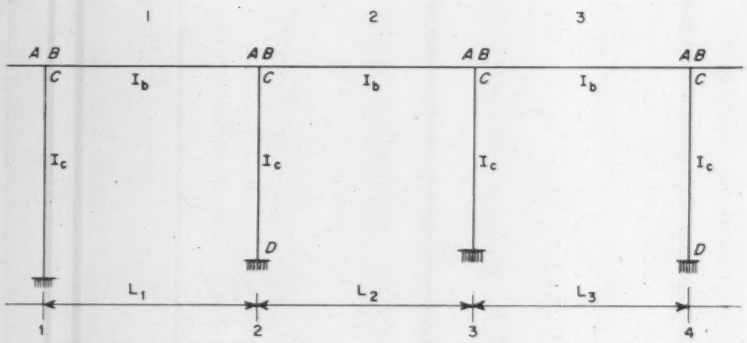
Utilizing the method of moment distribution, the computer program originated by this firm is capable of handling any pier bent irrespective of varying column heights, beam spans, skews to bridge centerline and cantilever overhangs.

Individual effects of all standard AASHO loadings are automatically combined in the computer to give the maximum design values for the standard loading groups as tabulated under Section 3.4.1 of AASHO specifications.

Input data required by the computer are: a) number of spans; b) sizes of beams and columns; c) span lengths and column heights; d) loads; e) loading

Pier Bent Design Program Output

Nomenclature:



Actual printed output:

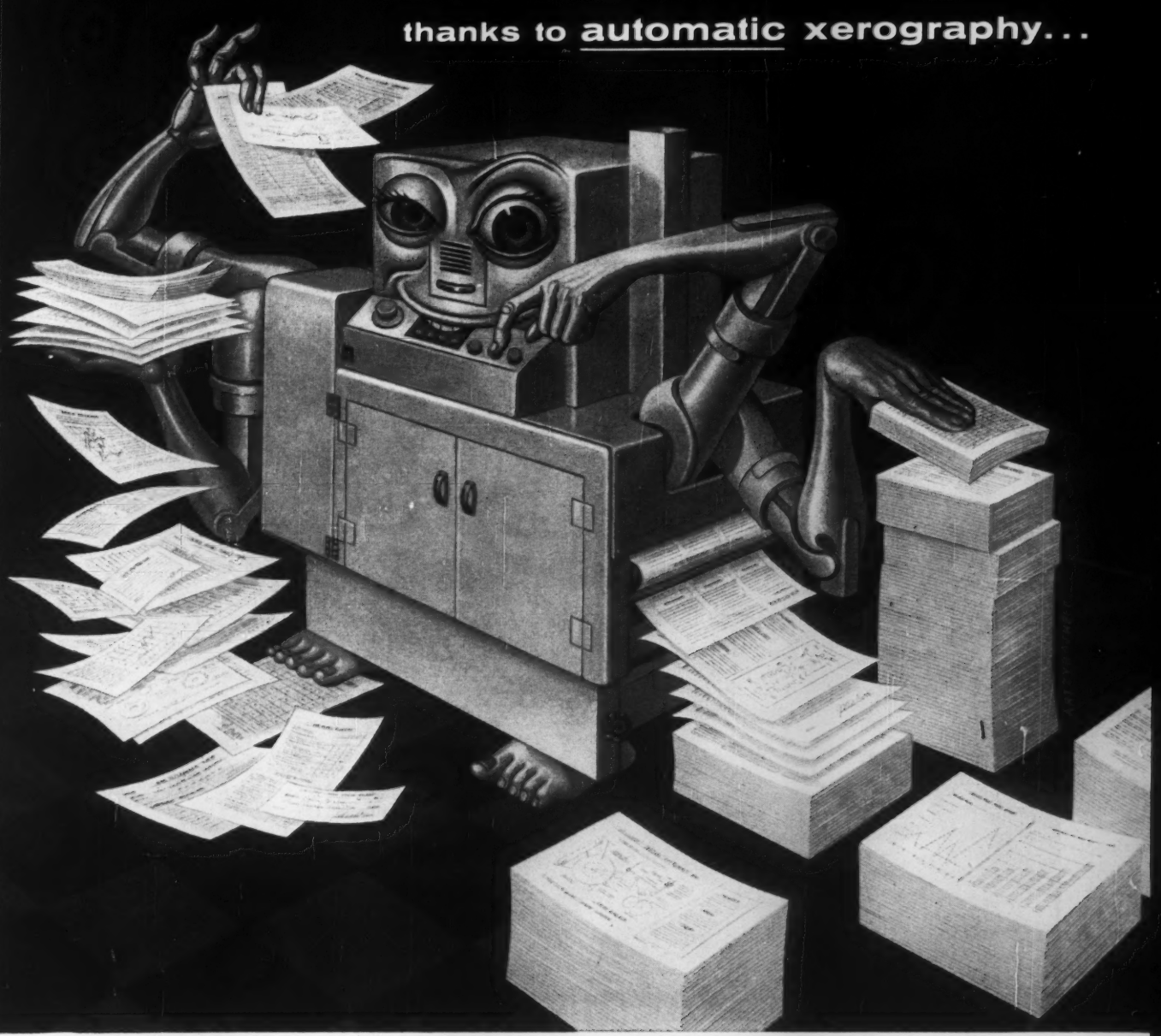
Dead Load, Wind and Temperature and Shrinkage Loading

Part 1—Table of Joint Moments (ft-kips) and Column Base Reactions (kips)

	Joint Moments				Col. Base Reactions	
Column	Joint A	Joint B	Joint C	Joint D	Vert.	Horiz.
1	0000	−0164	0164	0197	093.3	−012.7
2	−0443	0279	0164	0160	265.9	−011.4
3	−0361	0298	0063	0072	254.0	−004.7
4	−0045	0000	0045	0025	115.4	−002.5
					Total	−031.3

Part 2—Table of Beam Moments (ft-kips) and Beam Shears (kips)

	Span 1		Span 2		Span 3	
Tenth Point	Moment	Shear	Moment	Shear	Moment	Shear
0	0164	064.4	−0279	097.0	−0298	117.8
1	0251	043.9	−0140	076.6	−0125	097.4
2	0305	023.5	−0033	056.2	0015	077.0
3	0327	003.1	0041	035.8	0123	056.5
4	0315	−017.3	0082	015.3	0197	036.1
5	0271	−037.8	0090	−005.1	0239	015.7
6	0194	−058.2	0066	−025.5	0248	−004.7
7	0084	−078.6	0008	−045.9	0224	−025.2
8	−0059	−099.1	−0082	−066.4	0167	−045.6
9	−0235	−119.5	−0205	−086.8	0077	−066.0
10	−0443	−139.9	−0361	−107.2	−0045	−086.4



Push the button and copies flow!

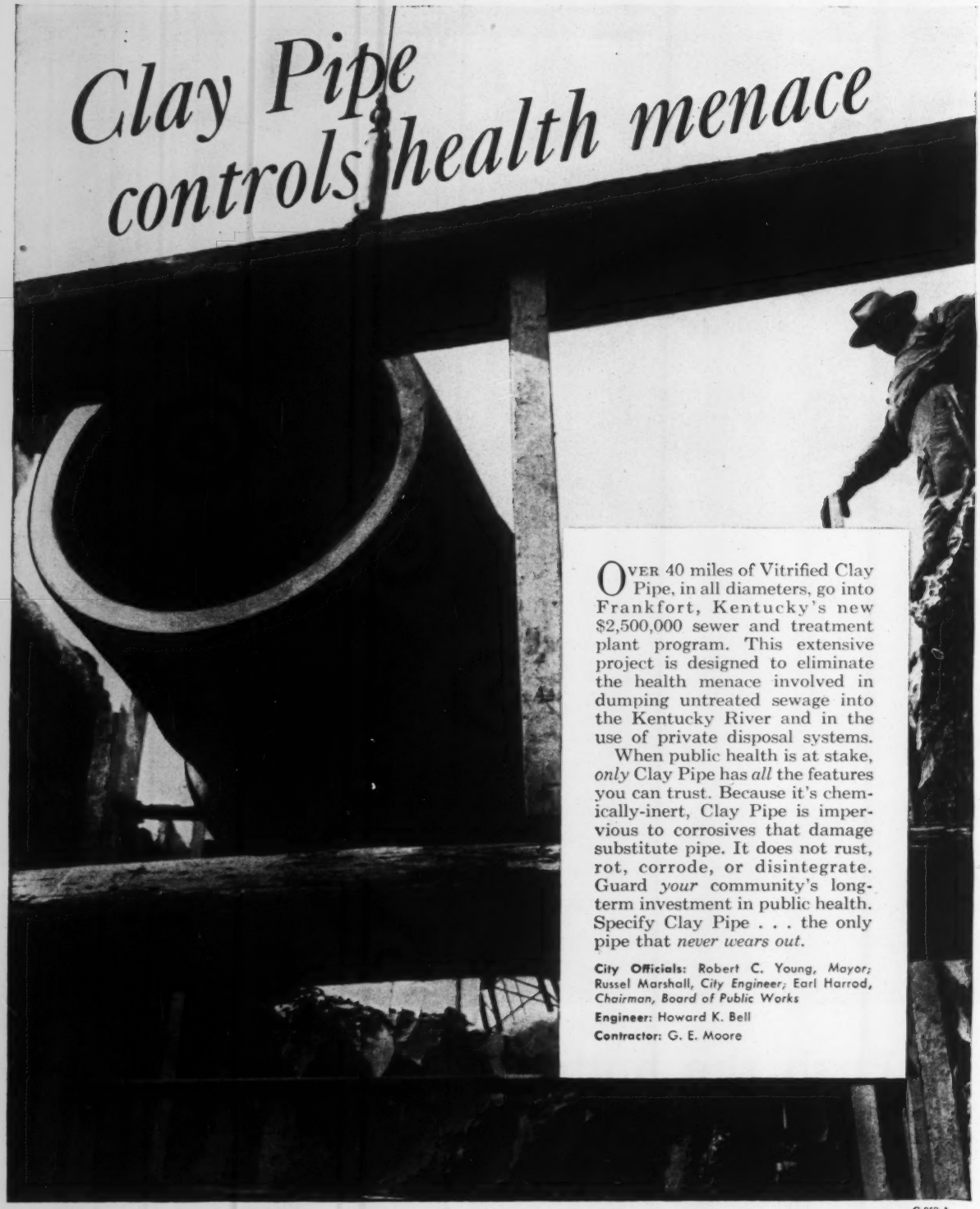
Here, as caricatured by Artzybasheff, is the mighty Copyflo® continuous printer—*automatic,* push-button xerography at its brilliant best—whose enormous appetite for volume copy problems is matched only by its speed, versatility, and high quality of output.

Wherever low-cost, volume copying is the need, look to automatic xerography for the happy solution. Copyflo printers turn out *dry,* positive prints up to 11 or 24 inches wide (depending on model), ready for immediate use. Copies emerge at the rate of 20 feet a minute, an 8½" x 11" print in less than three seconds.

Copyflo continuous printers enlarge, reduce, or copy size to size. They offer the speediest, most flexible, most economical way to get copies precisely like the original from microfilm or original documents.

For further information write to: Dept. 58-133X, Haloid XeroX Inc., Rochester 3, N. Y. Branch offices in principal U. S. and Canadian cities.

HALOID XEROX®



OVER 40 miles of Vitrified Clay Pipe, in all diameters, go into Frankfort, Kentucky's new $2,500,000 sewer and treatment plant program. This extensive project is designed to eliminate the health menace involved in dumping untreated sewage into the Kentucky River and in the use of private disposal systems.

When public health is at stake, *only* Clay Pipe has *all* the features you can trust. Because it's chemically-inert, Clay Pipe is impervious to corrosives that damage substitute pipe. It does not rust, rot, corrode, or disintegrate. Guard *your* community's long-term investment in public health. Specify Clay Pipe . . . the only pipe that *never wears out.*

City Officials: Robert C. Young, *Mayor;* Russel Marshall, *City Engineer;* Earl Harrod, *Chairman, Board of Public Works*

Engineer: Howard K. Bell

Contractor: G. E. Moore

C-358-1

Vitrified **CLAY PIPE** *Never Wears Out*

NATIONAL CLAY PIPE MANUFACTURERS, INC. 1820 N Street, N. W., Washington 6, D. C.

311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio • 783 Ninth & Hill Bldg., Los Angeles 15, California • Box 172, Barrington, Illinois • 206 Mark Bldg., Atlanta 3, Georgia

groups required (AASHO 3.4.1).

The computer turns out:

- Final design values of all joint moments.
- Final design moments and shears at tenth points of beam.
- Final design column base reactions.

The accompanying box illustrates one portion of the print-out for a pier in an interstate structure.

For the present it is expedient to pick reinforcing steel from graphs prepared by K&G, relating the final design moments, shears and thrusts to areas of steel required. However, the computer program is being expanded to include this phase of the work.

CONCRETE CISTERN feeds underground tile drain beneath hillside orchard into man-made lake in background.

A Novel Drain Design Stops Hillside Erosion

Erosion of an apple orchard running up the sides of two hills near Charlottesville, Va., has been prevented by a novel system of underground drain tiles, cisterns, a dam and an artificial lake.

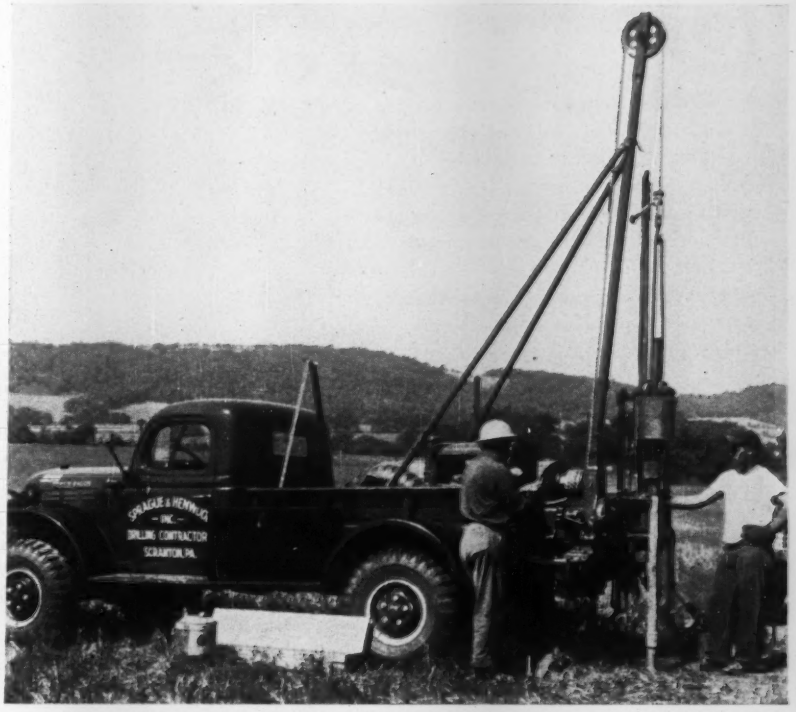
The owners enlisted the aid of Soil Conservation Service engineers to design the drainage system when runoff began to carve large gullies in the long slope between the hills.

About 900 ft of 15 in. underground drain tile was laid beneath this slope. Then six concrete cisterns were built above ground spaced along the line. Thirty-two 4 in. tiles in each cistern handle the surface runoff. The system empties into a man-made, 10 acre pond 22 ft deep.

Digging the pond and forming the earth dam cost $3,000. The drainage system was installed for $2,500. The system had no trouble handling a 10 in. hurricane rain that filled the pond.

SUB-SURFACE INVESTIGATIONS FOR THE STRUCTURE YOU ARE PLANNING

Highways · Tunnels · Bridges · Buildings · Dams



A Sprague & Henwood Drill Crew Recovering Soil Samples For A Highway Relocation Project

The lasting success of any construction project depends on the design of a proper foundation; and the design, in turn, depends on an adequate knowledge of the sub-surface soil and rock.

Sprague & Henwood's unbeatable team of experienced drill crews, modern equipment, and expert supervision is your assurance that the soil samples and rock cores recovered will be the best obtainable under the conditions that prevail. The structures of tomorrow are only as good as they are designed today, based upon a complete, accurate, and dependable sub-surface study.

Behind Sprague & Henwood's drilling and supervisory personnel is 75 years of accumulated knowledge and experience, gained from completing thousands of successful drilling contracts, under every conceivable condition.

The equipment used is first-quality and of the proper type. It is built in Sprague & Henwood's own plant, and is "field-tested" prior to being put into general use to insure customer satisfaction and completion of the job in the shortest possible time.

Crews and adequate equipment are located throughout the United States. Other services include grout-hole and blast-hole drilling and pressure grouting.

SPRAGUE & HENWOOD, Inc.

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BRANCH OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH • ATLANTA
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An Economical New Fastening System For Asbestos Sheets

The economical new Townsend Tuff Tite fastening system for asbestos produces waterproof joints without expensive, time-consuming caulking, whether you prefer tapping screws or bolts. Weather-proofing and vibration resistance are provided by the conical neoprene washer, which completely fills the hole. Fastener and neoprene washer arrive on the job pre-assembled and ready to install.

If you are fastening corrugated asbestos or sandwich board, you can effect important economies with Townsend Tuff Tites. Write for full information. Townsend Company, P. O. Box 237-L, New Brighton, Pennsylvania.

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Education

COMPUTER ENTERS CLASSROOM for UCLA graduate program to make executives out of engineers.

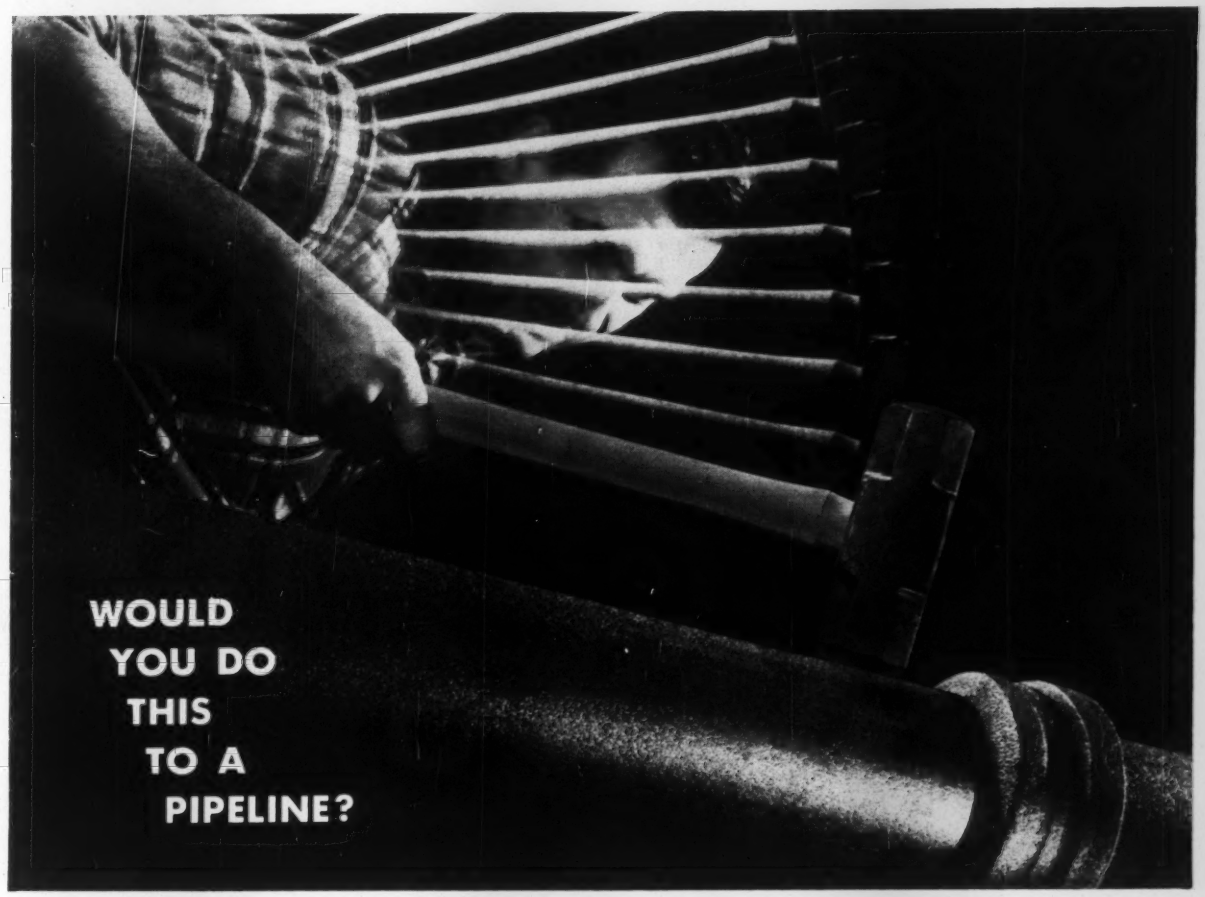
Program for Executives Includes Computer Course

In an educational experiment at University of California at Los Angeles, an electronic computer is being used to help prepare engineers for executive positions. Known as the Engineering Executive Program, it plans to expose the engineer showing executive promise to accounting, financial, personnel, labor relations and other management problems. The "quantitative approach" is used as problems are solved in terms of numbers.

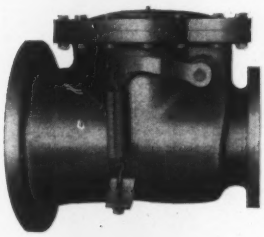
"We want engineers to be able to use digital computers with as much confidence as their slide rules," said Morris Asimow, professor of engineering at the university.

UCLA is believed to be the first college in the country to acquire an electronic computer (Bendix G-15) for classroom use. Limited to engineers, the course is designed to turn out executive candidates with these combined skills and talents. Applicants, preferably between 30 and 35 years of age, must have several years experience in industry in addition to an engineering degree and a B average in school. The program is at graduate work level and upon successful completion leads to a master's degree.

Some 60 engineers, representing many of Southern California's major industries, are presently enrolled in the four semester program at the Los Angeles school.



CHECK VALVE SLAMMING CAN BE JUST AS BAD!



Even moderate slamming can raise cain with a pump discharge line, causing leakage, throwing pipes out of line or causing other damage that may not be discovered for years. And heavy slamming can cause serious damage and service interruption.

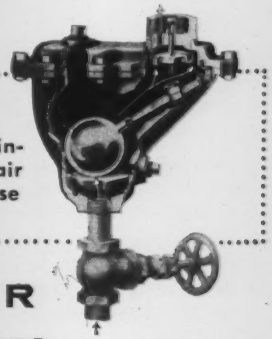
However, check valve slamming CAN be prevented . . . by installation of Ludlow and Rensselaer List 340 non-slamming check valves. These are non-slamming under most severe conditions, by virtue of adjustable spring tension, and are recommended as standard equipment wherever slamming is likely to occur.

Ludlow and Rensselaer check valves are available in sizes from 3 to 30 inches, with or without lever arm and spring. All materials and workmanship exceed the A.W.W.A. requirements for gate valves and fire hydrants.

Write today for the L&R Check Valve Catalog

FOR POSITIVE CONTROL

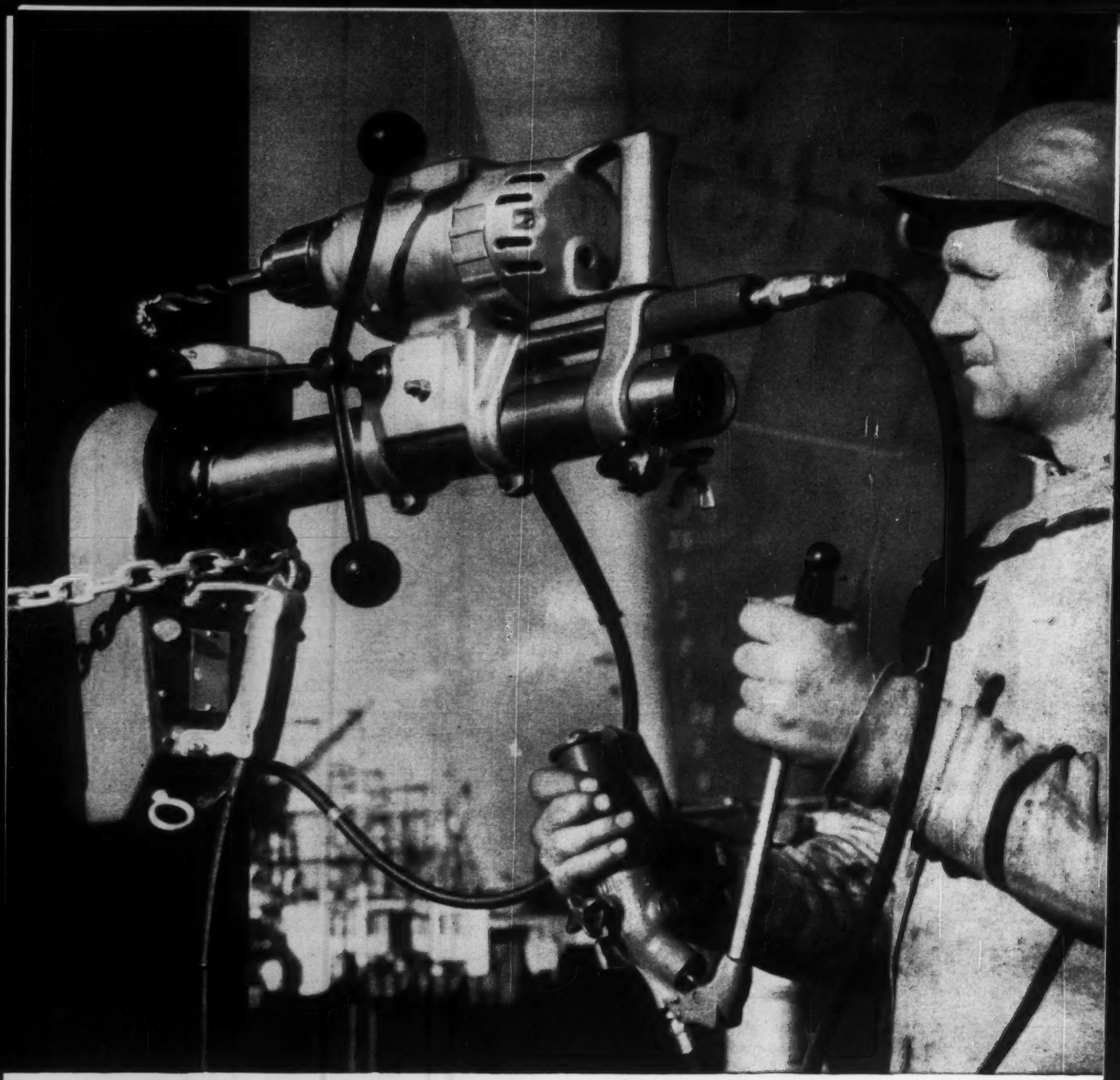
of air inlet or discharge, install Ludlow or Rensselaer air and vacuum and air release valves.



LUDLOW & RENSSELAER

VALVES & HYDRANTS

THE LUDLOW VALVE MANUFACTURING CO., INC., TROY, N.Y. SINCE 1861



Sticks like glue . . . works in

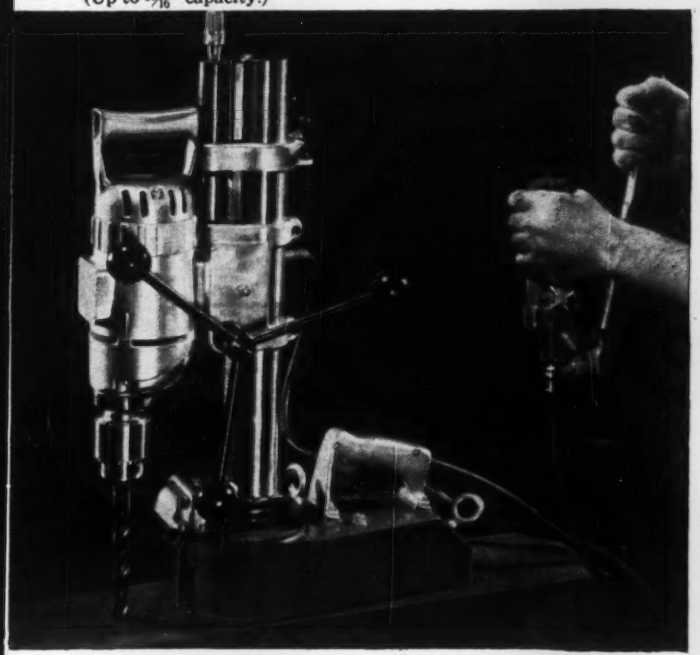
You are looking at a Black & Decker Magnetic Drill Press at work 15 feet off the ground! No operator holds it—it *holds itself* to the work with over a thousand pounds of magnetic power. No operator touches it—he feeds it precisely into the work with fingertip pressure on the exclusive B&D Hydra-Power Feed.

The new B&D Magnetic Drill Presses are truly so unusual they must be seen to be appreciated. They come in two capacities—¾" and 1¼". They are complete precision units—not attachments. They drill, ream and tap upside down, on their sides or upright. They are ideal for tool shops, steel fabricators, heavy machinery, maintenance . . . anywhere you have to take a drill press to the work. THE BLACK & DECKER MFG. Co., Dept. 2105, Towson 4, Maryland. (In Canada: Brockville, Ontario.)

See the Features of the NEW Black & Decker Magnetic Drill Presses

1¼" MAGNETIC DRILL PRESS works high in the air upside down! (Up to 1¼" capacity.)

¾" MAGNETIC DRILL PRESS goes to the work, drills upside down, too! (Up to 13/16" capacity.)



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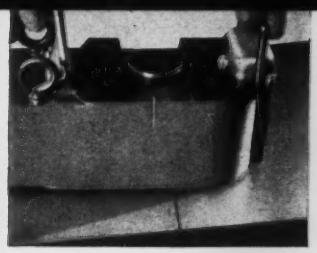
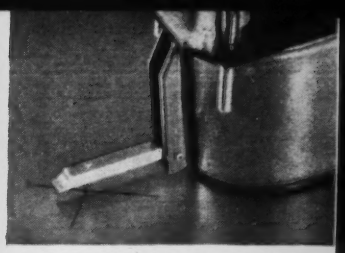
Look Under "TOOLS-ELECTRIC" in 'Yellow Pages'

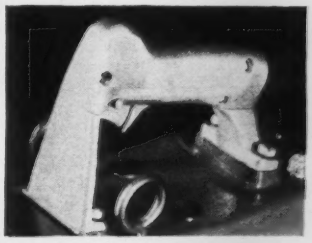


★ MULTIPLE USE! Magnetic Unit of 1¼" Press may be used to hold pieces for butt welding, etc!

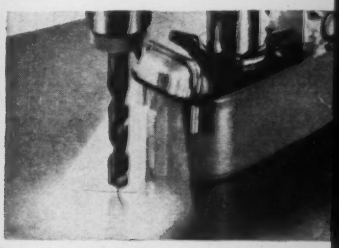


★ CLOSEST TOLERANCES! Drill Point Locator provides accuracy never before possible! Built into magnet.

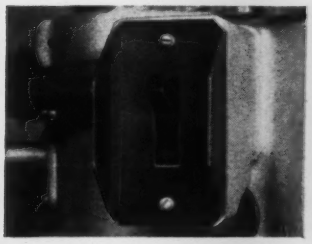
Check these exclusive Black & Decker features!



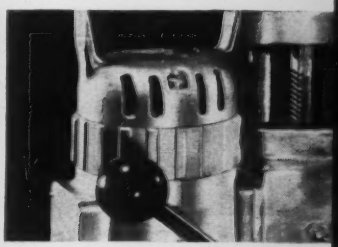
★ SAFETY-GRIP SWITCH keeps magnet always "on" after operator releases switch trigger—another safety plus.



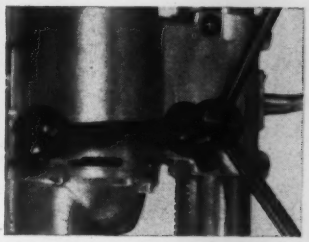
★ WORK AREA BRIGHTLY LIT by exclusive headlight. Special ruggedized bulb withstands hard usage.



★ LONGER LIFE—INCREASED SAFETY results from built-in time delay in 1¼" Reversing Switch. Prevents motor being reversed too rapidly.



★ LONGER LIFE—INCREASED SAFETY as Reversing Switch of ¾" Press is turned. Switch goes to "neutral" then "on" again in other direction.



★ HIGHEST ACCURACY results from unitized construction of drill press—cannot work loose, no side play . . . Drill Press is an integral unit.

★ DRASTICALLY INCREASED SAFETY due to location of magnet near drill point. Provides maximum magnetic power at drill pressure point.

MAIL COUPON TODAY FOR A FREE DEMONSTRATION!

THE BLACK & DECKER MFG. CO., Dept. 2105, Towson 4, Md.

☐ Please arrange a demonstration of your ☐ 1¼"; ☐ ¾" Magnetic Drill Press

☐ Please send me additional information

Name_____ Title_____

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Weldynamics

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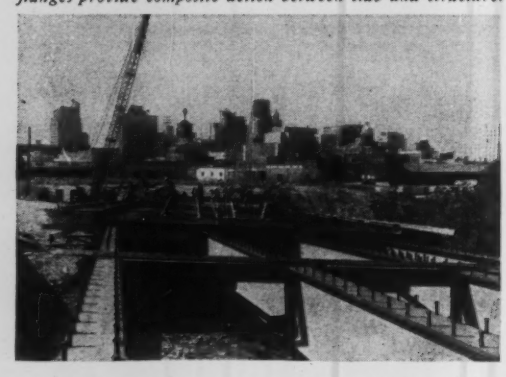
How Weldynamics cuts cost of bridges 15-20%

The Crauford Elysian Bridge, Houston, Texas. All welded deck type construction. Shear connector studs welded to girder flanges provide composite action between slab and structure.



WELDYNAMICS, the science of cutting costs with welding, provides modern, safe, attractive bridges at lower costs. This is true because welded design requires less steel—eliminates rivets and reinforcement necessary to riveted design, and permits more efficient use of steel to handle greater loads without increasing weight.

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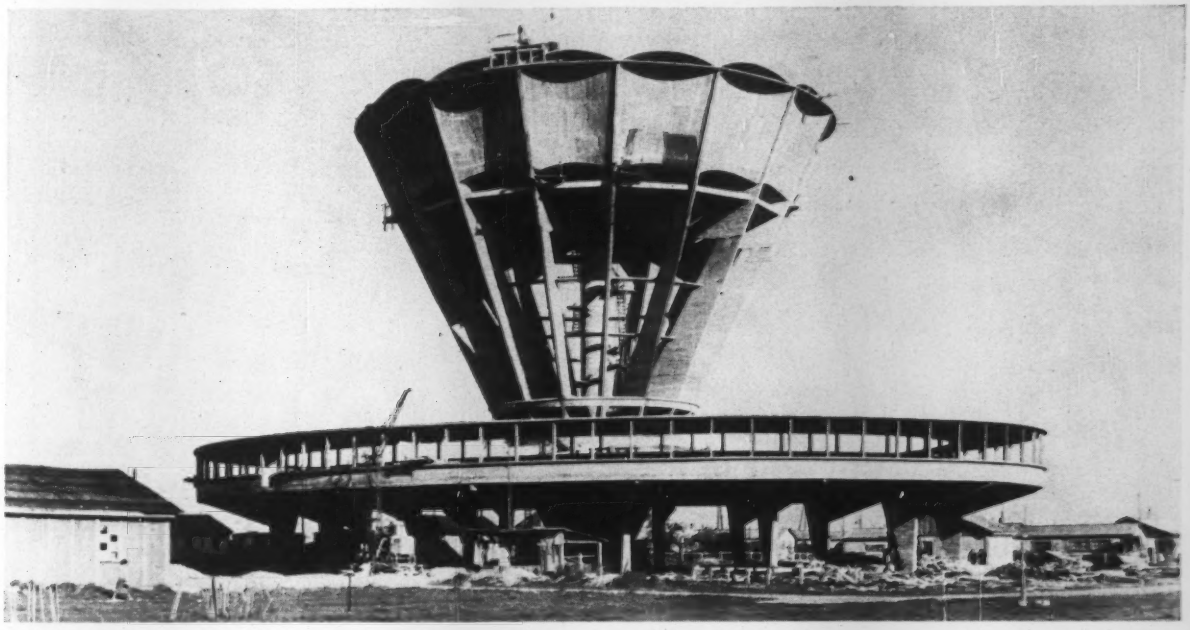


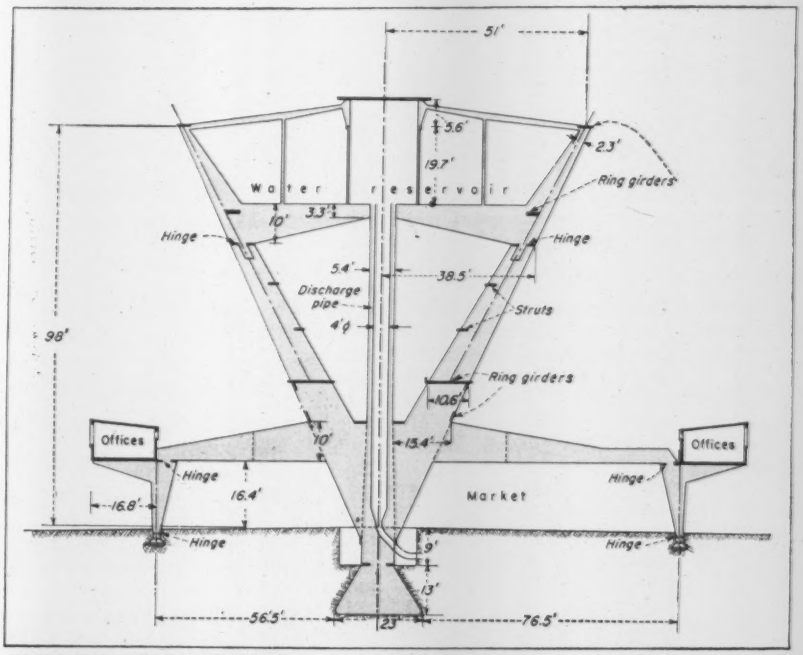
NOVEL DESIGN combines water tower, government offices and a municipal market into a . . .

Three-in-One Structure for City Services

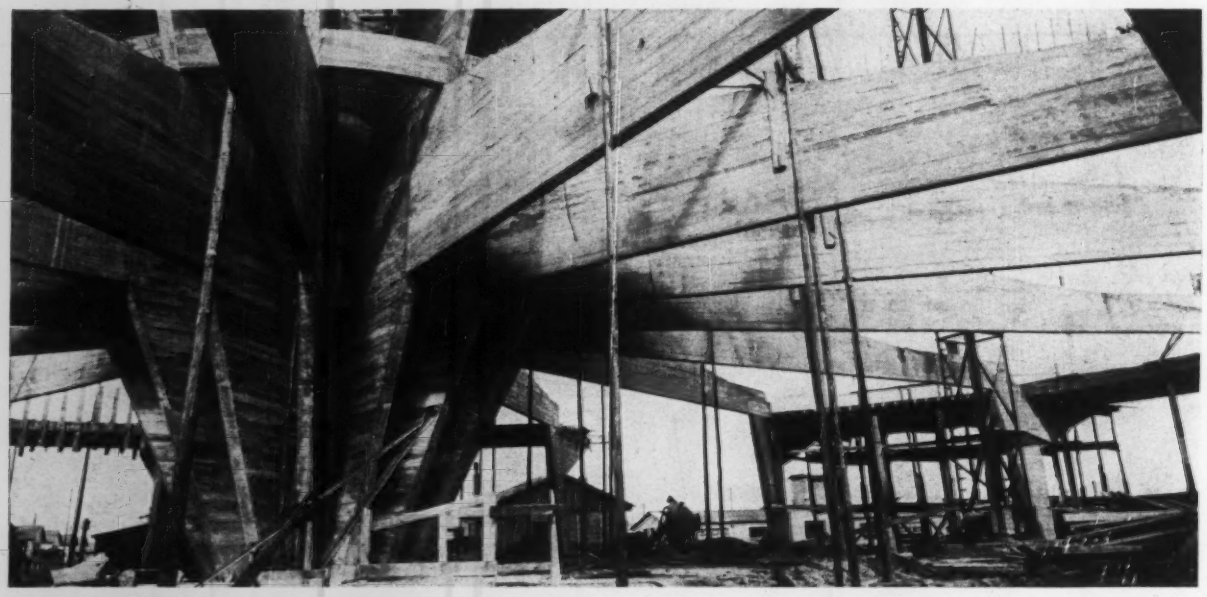
Expanding like cities everywhere, Caen, France, needed a new elevated water supply, a new city market and more municipal offices to serve one of its new suburbs, La Gueriniere, where housing for 10,000 persons has recently been built. The unique solution, resulting from a design competition, has been to provide all three of these services in a single structure of unusual appearance and ingenious design.

According to the winning firm, SETA of Paris, the structural shape was developed to suggest a conical wine glass rising above a flat base, which was made elliptical in plan in order that the market, placed at ground level, would cover as much of the rectangular plot as possible. The water would be stored in the top of the cone, and the base would also accommodate a series of offices over the market along the edge of the ellipse. The SETA design was the product of Guillaume Gillet, an architect and Rene Sarger, director of the engineering firm, CETAC.

The wine glass form was chosen, not because of any symbolism, but because it permitted concentrating all of the columns supporting the water tank at the center of the plot and thus freeing the market area from any obstructions.

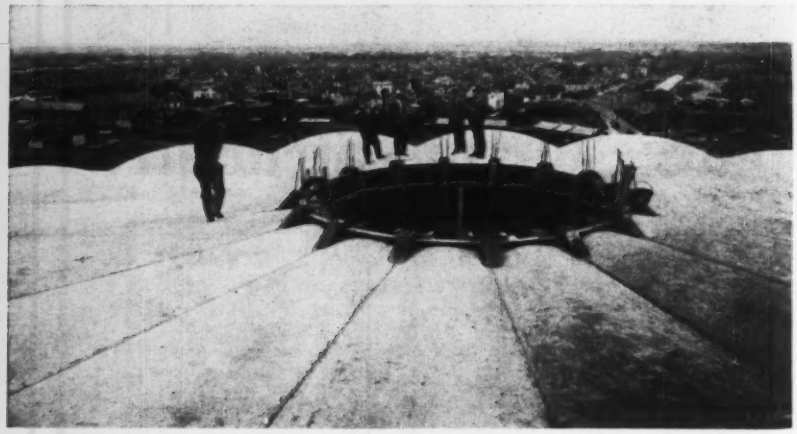


FRAMING ARRANGEMENT is focused on support of the 5,000 ton reservoir by inclined columns rising from a single foundation block. Column stability is provided by the roof beams of the ground level market and by ring girders encircling the columns. A multiplicity of hinges is used to simplify design calculations.



BASE OF STRUCTURE shows how slab shaped columns are braced by roof beams of market and by ring girders.

CENTRAL RISER supports water tank beams and carries pipe outriggers.



ROOF OF RESERVOIR consists of thin shell concrete arches between radial beams. Similar construction is used for bottom of reservoir and for roof of market.

The columns, numbering 16, are slab shaped members rising from a single foundation block and flaring outward until their tops outline a circle about 100 ft in diameter, within which the 810,000 gal water tank is located. Lines of horizontal struts between the columns at several levels provide lateral stability, while four sets of ring girders, two top and bottom of the water tank and two just above the market roof, keep the columns from spreading outward.

Principal bracing for the columns, however, comes from the market roof framing, which consists of 16 radial beams, one to each main column. The outer ends of these beams rest on short columns cast with a cantilever projection on which the ring of municipal offices is installed. The weight of these offices helps to counterbalance the loads at the ends of the radial roof beams.

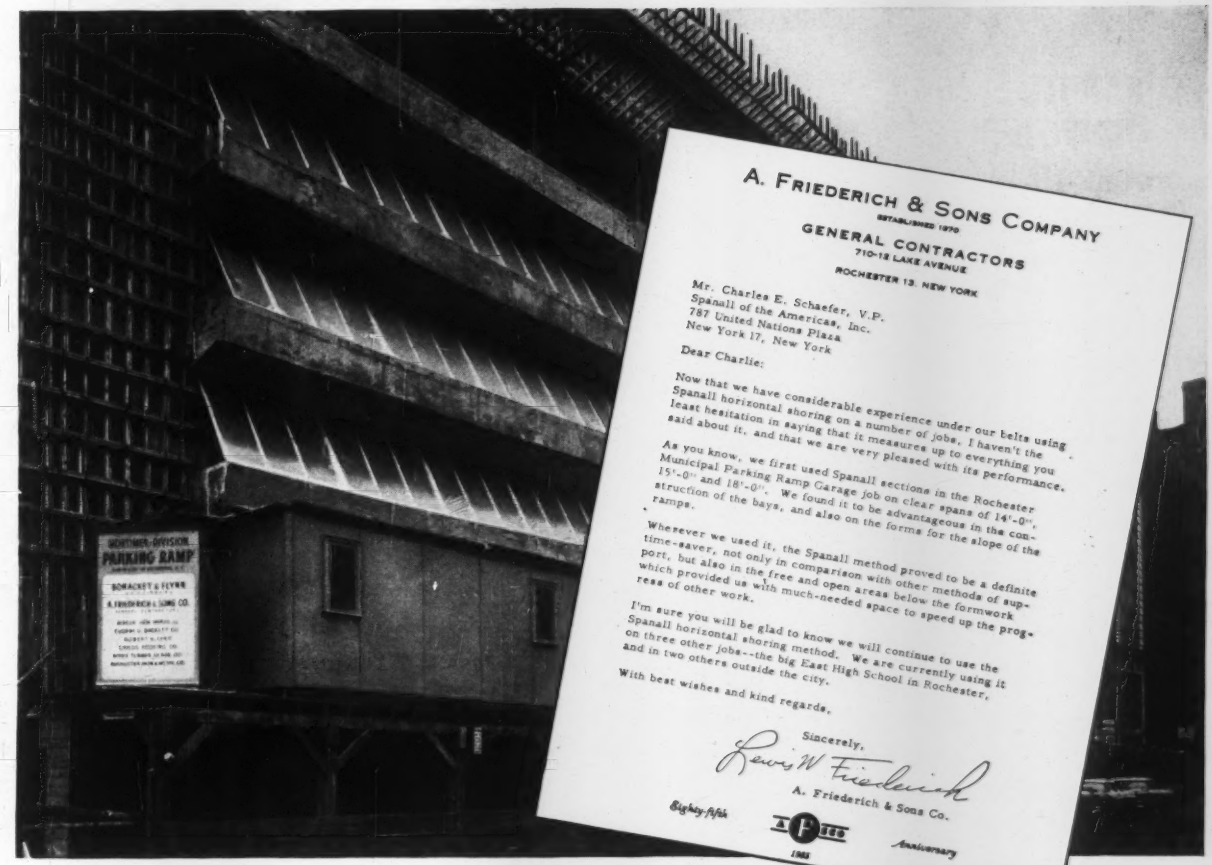
The central foundation block of the structure is in the form of a cone, 23 ft in diameter at the base and 13 ft high, set 22 ft deep into the limestone rock. The loads from the converging main columns, totaling 5,000 tons, are brought together on a central circular section 8.2 ft in diameter from which they are transmitted to the foundation block through the medium of a heavily reinforced hinge joint whose effective contact surface measures 4.6 ft in diameter.

In addition to the hinge at the central foundation, hinges are placed at the bottom and top of the short columns at the exterior of the structure and in the main columns at the bottom of the elevated reservoir. All of these joints were installed to simplify the calculations in the rather complicated structure.

The reservoir framing consists of a series of U-shaped frames in the planes of the main supporting columns. The outer ends of the horizontal part of the U's rest on the main columns while the inner ends butt against and are supported by the central water riser. Thin shell arches between these beams comprise the floor of the reservoir.

The roofs of both the reservoir and the market are also made up of a series of thin shell arches spanning between the beams radiating from the center of the structure. The walls of the reservoir are thin arches built up of concrete blown against a set of exterior forms. All of this shell concrete is 3 in. thick.

(*International continued on page 96*)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Dear Charlie:
Now that we have considerable experience under our belts using Spanall horizontal shoring on a number of jobs, I haven't the least hesitation in saying that it measures up to everything you said about it, and that we are very pleased with its performance.
As you know, we first used Spanall sections in the Rochester Municipal Parking Ramp Garage job on clear spans of 14'-0", 15'-0" and 18'-0". We found it to be advantageous in the construction of the bays, and also on the forms for the slope of the ramps.
Wherever we used it, the Spanall method proved to be a definite time-saver, not only in comparison with other methods of support, but also in the free and open areas below the formwork which provided us with much-needed space to speed up the progress of other work.
I'm sure you will be glad to know we will continue to use the Spanall horizontal shoring method. We are currently using it on three other jobs--the big East High School in Rochester, and in two others outside the city.
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Sincerely,
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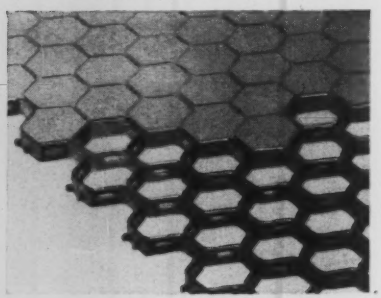

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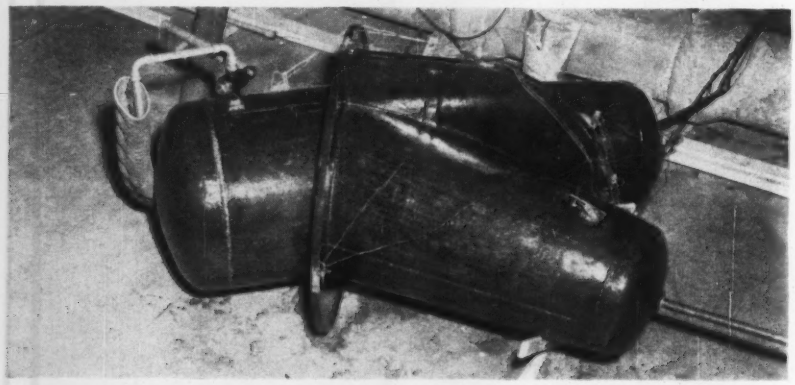
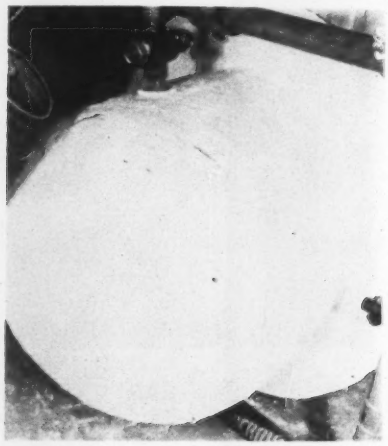


BIFURCATE MODEL is wired for strain gauge measurement. It was later whitewashed.



CRACKS APPEAR in the whitewash coating indicating yielding of the shell.

Model Tests Welded Bifurcate

A model test to check the structural behavior of a complex bifurcate under 600 psi was undertaken in connection with the first underground powerhouse of Australia's $1 billion Snowy Mountains Project. Design complexities and the importance of the bifurcate led to the building of 1 to 6.5 scale model.

Specifications require a 12 ft dia shaft to bifurcate into two 8 ft dia concrete-backed steel pipes, each to supply a 96,000 hp turbine. The maximum design head is 600 psi requiring heavy stiffeners to resist deformation. Concrete and rock backing and two external girders are called for, in addition to an internal tie welded to the arms of a horseshoe girder.

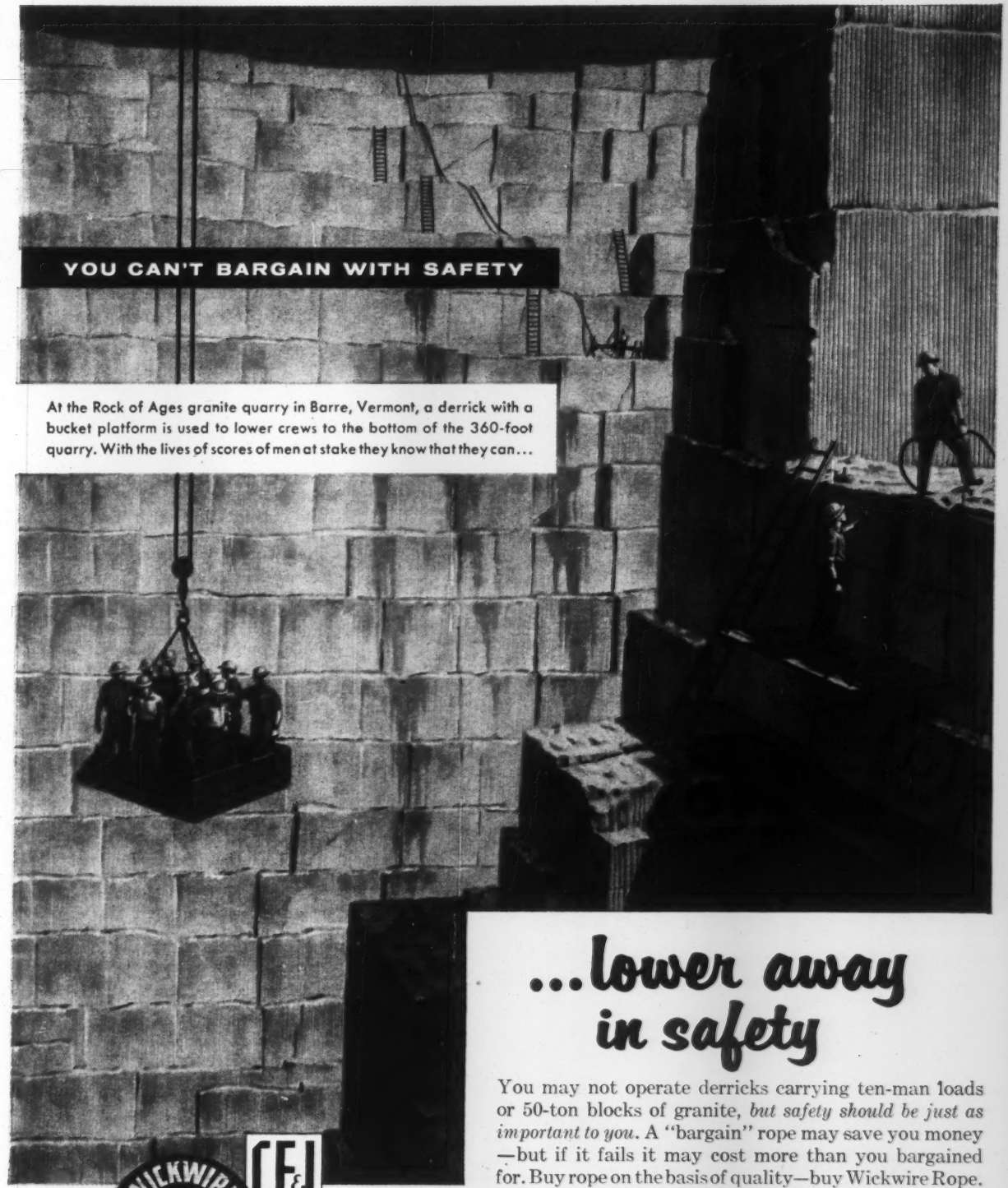
The girders are simple webs 2 in. thick with no flanges. The horseshoe girder between the short legs is thickened locally at the axis of symmetry where the maximum stress occurs. The tie-bar is built up from 2 in. and 1⅜ in. plates and the main shell thickness is 1⅝ in.

The bifurcate model was fabricated and tested in the Snowy Mountains Authority's workshop. Steel plate ¼ and ⅛ in. thick was employed. A pump capable of a 2,500 psi pressure was used. The model was filled with water and pressure was transmitted through a diaphragm. An adjustment needle valve was used to admit water into the model and it was kept closed while the test pressure was built up.

An air escape line was fitted to the high point and was closed when a steady flow of water appeared.

Strain measurements were made with electric resistance strain gauges cemented at critical stress points inside and outside the model. The leads from the internal gauges were run through a gland in the second small bulkhead, then to a selector switch unit, that made possible rapid successive gauge readings. As a visual indicator of yield, two coats of whitewash were applied to the model.

The test pressures were run in 100



At the Rock of Ages granite quarry in Barre, Vermont, a derrick with a bucket platform is used to lower crews to the bottom of the 360-foot quarry. With the lives of scores of men at stake they know that they can...

...lower away in safety

You may not operate derricks carrying ten-man loads or 50-ton blocks of granite, *but safety should be just as important to you*. A "bargain" rope may save you money—but if it fails it may cost more than you bargained for. Buy rope on the basis of quality—buy Wickwire Rope.

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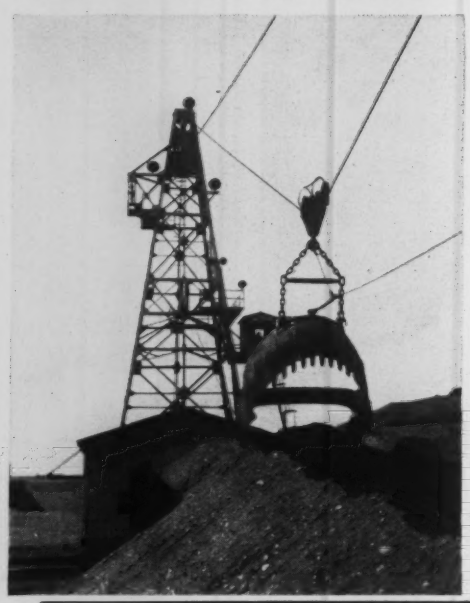
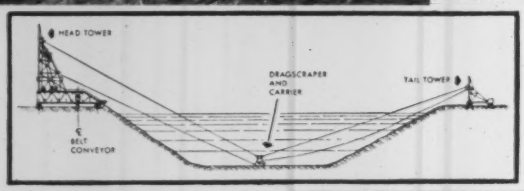
Tough Digging, Long Hauls... Routine Jobs for Sauerman DragScrapers



240-Ft. Bank... 350-Ft. Haul

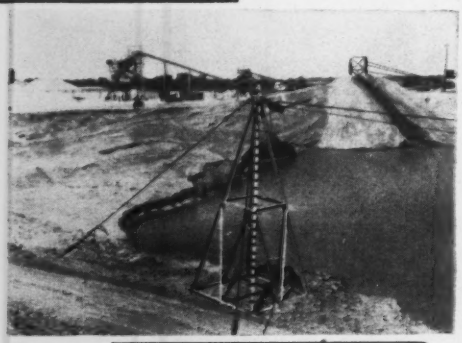
This mobile Sauerman Tower Excavator digs 480 yds. per hr. on an average haul of 350 ft. from a high bank to a portable field hopper. The 12-yd. Crescent DragScraper operates between steel head and tail towers. The towers are mounted on two sets of railroad tracks and ride on four sets of trucks. DragScraper power is supplied by two hoists mounted on the head tower. One hoist operates the load and pull-back cables, the other is used to tension the track cable. The hoists are controlled by one operator located in the cab on the tower. The load cable handles over 400,000 tons of material before replacement.



Drawing shows typical mobile tower excavator digging in wet pit.

75 Ft. Under Water... 800-Ft. Span

A 5-yd. rapid-shifting DragScraper supplies about 200 yds. per hr. to the plant hopper in background. Bridle tower in foreground is one of two supporting the bridle shifting cable which is controlled by the third drum of the Sauerman hoist. Lateral shifting of the DragScraper's line of operation is readily accomplished by power-shifting the trolley and tail block to a new position on the bridle cable. The DragScraper is digging 75 ft. under water and the operating span is 800 ft. from head frame to the bridle towers. Over a million tons have been excavated from this pit. The DragScraper often operates 24 hrs. a day to handle contract demands.



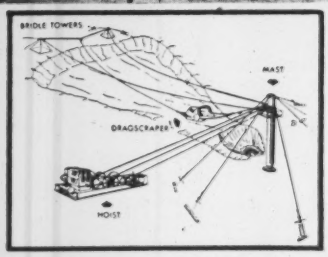


Diagram shows details of Sauerman rapid-shifting DragScraper.

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psi stages up to 1,000 psi. After this, the pressure was raised steadily until the cracking of the whitewash indicated yielding of the shell at about 1,500 psi (2½ times the maximum working pressure).

In the prototype, a considerable portion of the load will be taken by the concrete and rock support for the bifurcate.

Thriving Business

Austrian construction industry in high gear

With a record 1957 behind them, Austrian contractors see 1958 as another thriving year for their industry. Costs are steady and construction allocations by governmental bodies are higher now than they were last year. However, the state agencies are under criticism for timing the release of budgeted funds so that 70% will not be paid out until the last half of the year. This may slow delivery of materials and bring some instability in prices. It may tighten further the labor shortage, already severe.

But aside from these and similar short-range complaints, contractors and other observers say that the postwar achievement of the construction industry has been remarkable. What is more, the industry can accomplish today what would have been considered as wildly impossible in 1947. Last year, some $500 million was spent on construction in Austria, preliminary figures show. The role of governmental agencies as investors is dominant, because $327 million of the total was financed by federal, provincial and district administrations; by nationalized industries; and by privately managed apartment projects using state funds.

• **Mergers helped**—In 1947, a similar volume of construction would have required almost one-third of the total industrial labor force. Behind this tremendous growth in efficiency, according to competent observers, are the merger or combination of small firms into larger units, the availability of new construction equipment, and the adoption of new methods.

Another comparison industry statisticians have worked out is that if construction of a modern apartment building were done according to the methods of 1920 the cost would be 20 times what it now is. Construction people use this comparison to underline some of the important changes in the industry since that time. One is the stretching out of the construction season from six months (May to October) to the

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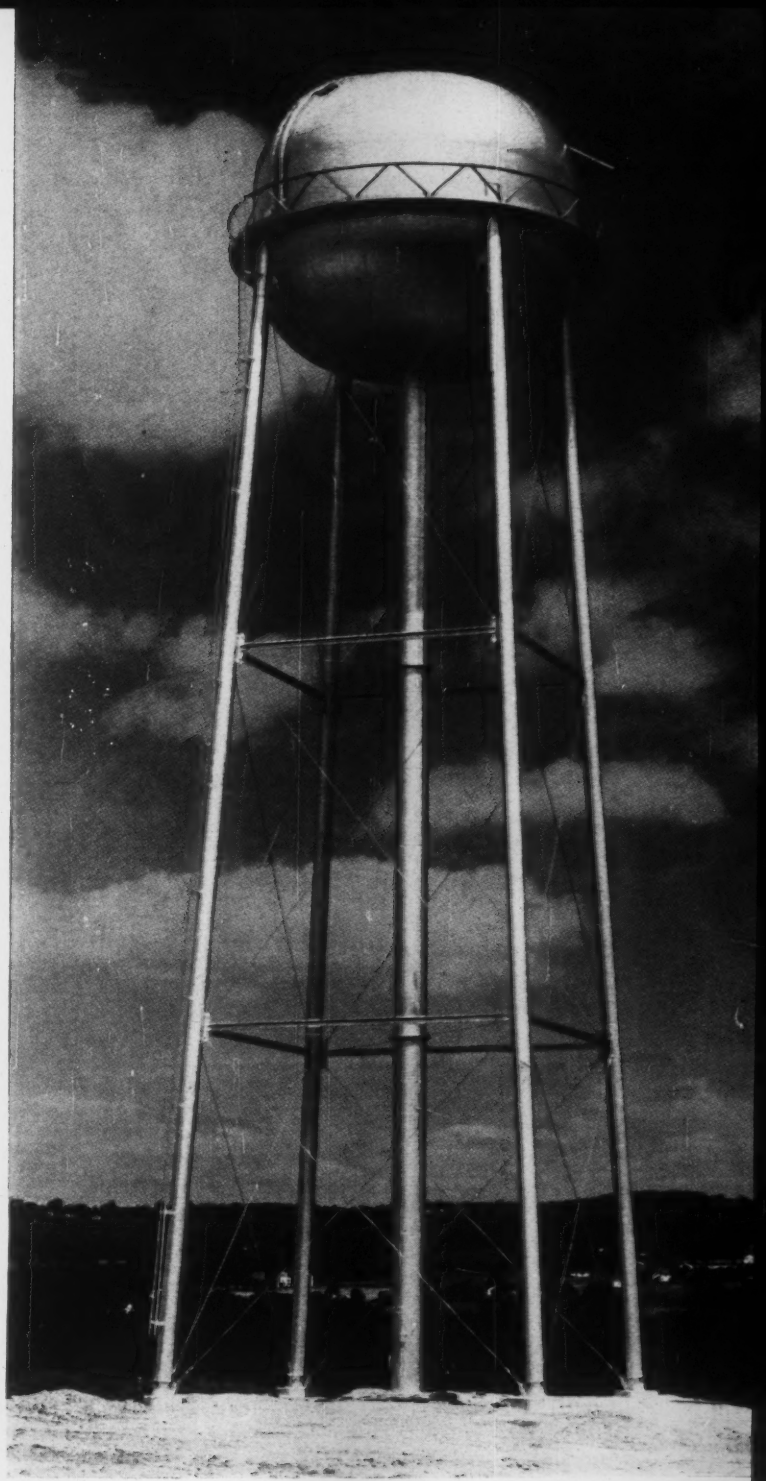

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full year. Another are the new methods builders have adopted. For instance, installation of central heating is one of the steps first completed in homebuilding because contractors realize that outfitters do better work in warm rooms. Also, it helps dry the house in a shorter time.

• **Impact of modern equipment**—Modern equipment also has had a marked impact on the industry. Since World War II, more than $115 million in construction equipment has been purchased by the industry, the Association of the Austrian Construction Business reports.

Competition has been greatly intensified by this growth in efficiency and, in some cases, has given birth to certain sharp practices among contractors. This led to government sponsorship of a code for public agencies to follow in awarding construction contracts.

Wages and costs in the industry are practically unchanged from 1956. The labor market suffers from a shortage of apprentices and of skilled and even unskilled workers. But with adequate funds and supplies of materials, the labor factor may not knock down the expectation of another boom year for Austria's construction industry.

Large Irrigation Scheme Completed on Sardinia

Italian governmental agencies recently inaugurated the $40 million first phase of an irrigation scheme on the island of Sardinia which features two large concrete dams, 394 ft and 328 ft high. Soon to be irrigated are 123,500 acres of arid land in the plain of Campidano in the southern portion of the island which lies about 220 miles east of Naples in the Mediterranean.

The 394 ft dam is on the Flumendosa River. It is an arched gravity structure of 98 ft base width. Its reservoir will store 200,000 acre-ft of water. The 328 ft high dam is on the Mulargia River and will impound 245,000 acre-ft of water. The two lakes are connected by a 2.5 mile tunnel 13 ft in dia.

Irrigation water is carried to its destination through a 46 mile chain of tunnels, open flumes and pipelines.

The second phase of the Sardinia water scheme will involve several hydroelectric plants and a network of distribution canals to irrigate an additional 37,000 acres. The works are being financed by Cassa del Mezzogiorno, a governmental agency responsible for the development of southern and insular Italy. The first phase just completed required 5 years of construction time.

(*International continued on p. 105*)

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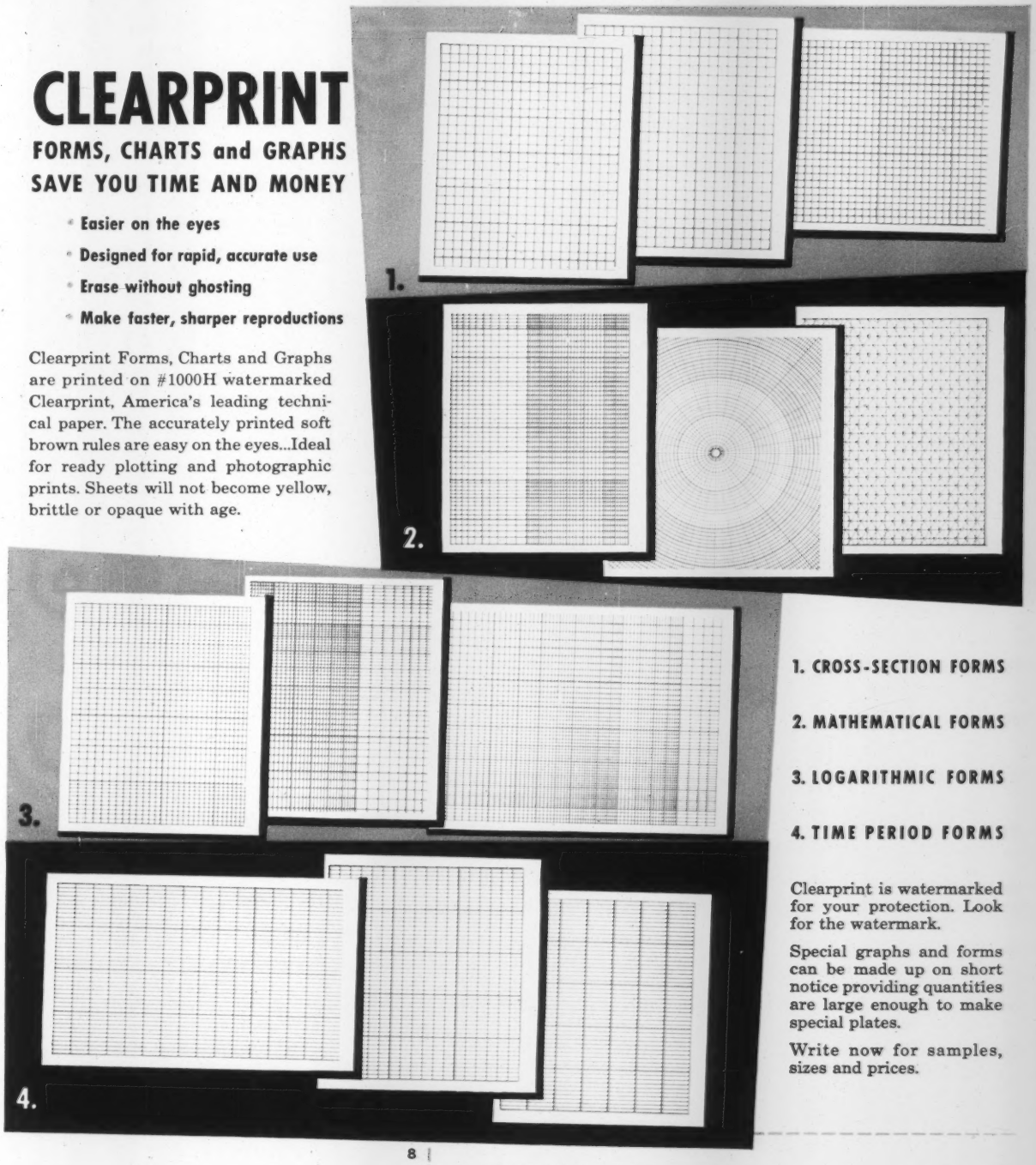

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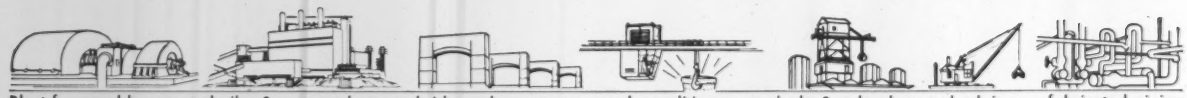


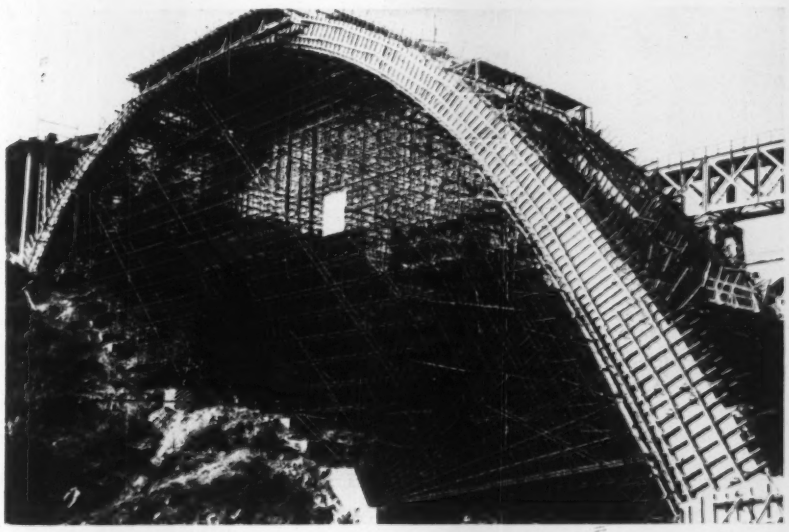
Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping

foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes

river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

Australian Arch Dam Rises

Progress at Tumut Pond Dam, part of Australia's great Snowy Mountains scheme, is shown in recent photo. To be an arch 290 ft high and 715 ft along crest, the dam's thickness will vary from 97 ft at base to 18 ft at crest. The structure was designed with the aid of the U. S. Bureau of Reclamation for the Snowy Mountains Authority and is being constructed by a joint venture of Kaiser-Walsh-Perini-Raymond. Tumut Pond's reservoir will receive water through the 14 mile 21 ft dia Eucumbene Tunnel on which the K-W-P-R joint venture is setting numerous hard rock tunneling records.



Radial Shores Support Arch Bridge Forms

Radial patterns relieve the usual right-angle geometry of steel-pipe shoring in the falsework for a concrete arch bridge over Italy's Petrace River. From footings built specially for the falsework, the pipes rise vertically or spread fanwise, as the location requires.

The bridge replaces one destroyed during World War II. A link in the main Naples-to-Sicily road, it is located in the toe of the "boot," 35 miles north of Reggio, the Calabrian city across Messina Straits from Messina, Sicily. A temporary bridge up the river will

You will find that exposing concrete aggregate with Sika Rugasol is simple because it eliminates the need for costly chipping, hacking or sandblasting. There are two types of Rugasol:

RUGASOL F . . . is painted directly on formwork. When forms are stripped (in 2 to 5 days), the retarded mortar is removed with a jet of water or stiff brush.

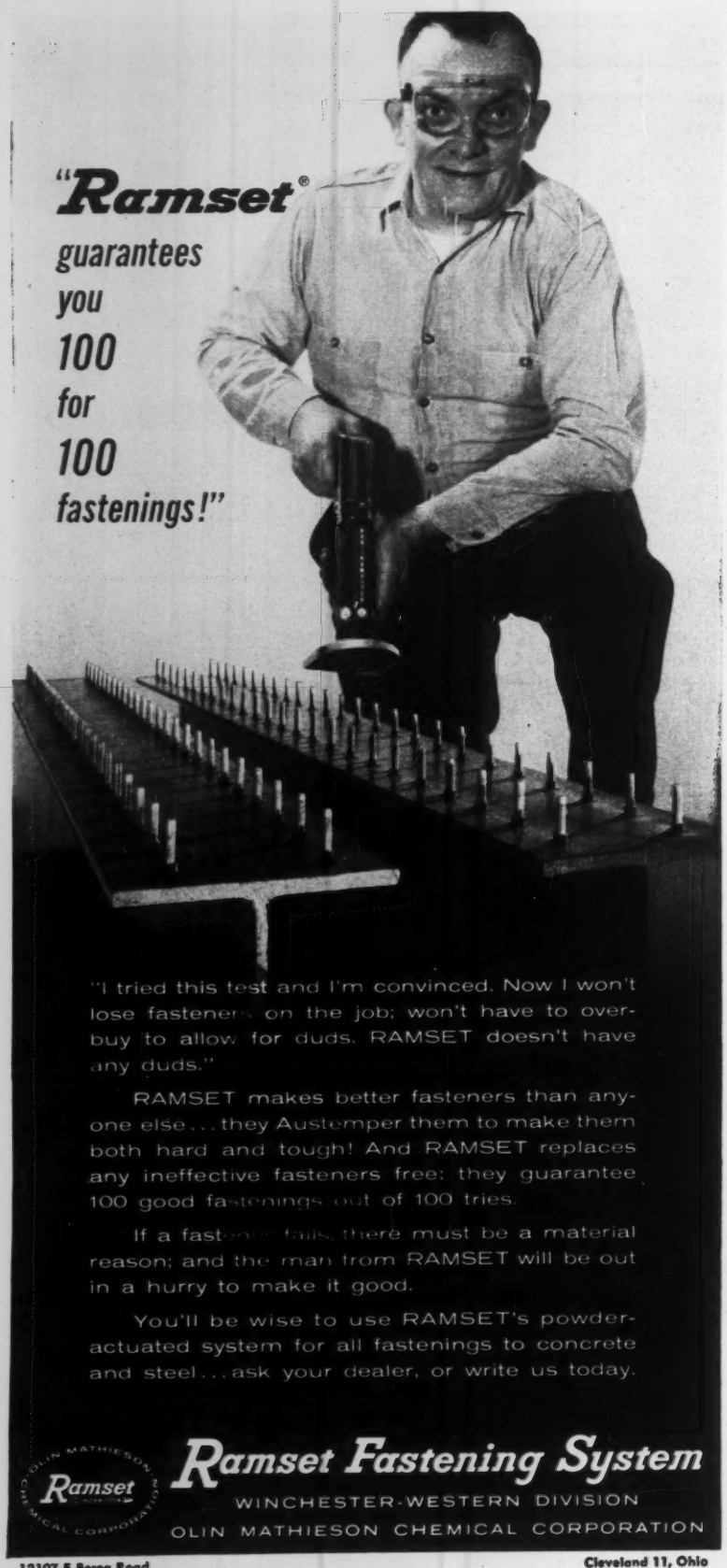
RUGASOL C . . . is applied on the surface of freshly placed concrete. On the following day, the retarded surface mortar is removed with a jet of water or stiff brush.

For complete information on Rugasol, call or write for Bulletin RG-58.

Ad 26-4

Sika SIKA CHEMICAL CORPORATION
PASSAIC, NEW JERSEY

DISTRICT OFFICES: ATLANTA • BOSTON • CHICAGO • DALLAS • DETROIT • NEW ORLEANS • PHILADELPHIA • PITTSBURGH • SALT LAKE CITY • WASHINGTON—DEALERS IN PRINCIPAL CITIES—AFFILIATES AROUND THE WORLD


"Ramset®
guarantees
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fastenings!"
"I tried this test and I'm convinced. Now I won't lose fasteners on the job; won't have to overbuy to allow for duds. RAMSET doesn't have any duds."
RAMSET makes better fasteners than anyone else... they Austemper them to make them both hard and tough! And RAMSET replaces any ineffective fasteners free: they guarantee 100 good fastenings out of 100 tries.
If a fastener fails, there must be a material reason; and the man from RAMSET will be out in a hurry to make it good.
You'll be wise to use RAMSET's powder-actuated system for all fastenings to concrete and steel... ask your dealer, or write us today.
Ramset Fastening System
WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
12107-E Berea Road
Cleveland 11, Ohio

continue to handle traffic until completion of the new crossing this summer.

The new bridge has three spans, 270 ft in the center and 224 ft on either side. The accompanying photo shows one of the side spans being formed up. The total width of 43 ft will be made up of a 35 ft roadway and two 4 ft sidewalks.

Alberto Bertele, of Turin, engineer-contractor on the bridge, rented 500 tons of the bitumen-painted pipe shores for the job at $40 a ton. The pipes are 6 to 20 ft long, 1.89 in. outside diameter and have walls 0.13 in. thick.

Plant to Make Coal Dust From Waste Water Sludge

A $1 million plant now under construction near Duisburg in the Ruhr region of Germany will recondition waste water sludge into 150,000 tons of coal dust per year plus a varying amount of iron concentrate.

The procedure of turning sludge into useful products will be of great importance because the Ruhr district is having difficulty finding dumping grounds for sludge from industrial waste. Sludge output of the factories in the Emscher section alone has increased by 15% to 4 million tons in 1957 and is expected to rise further while industry needs every square foot of ground for expansion.

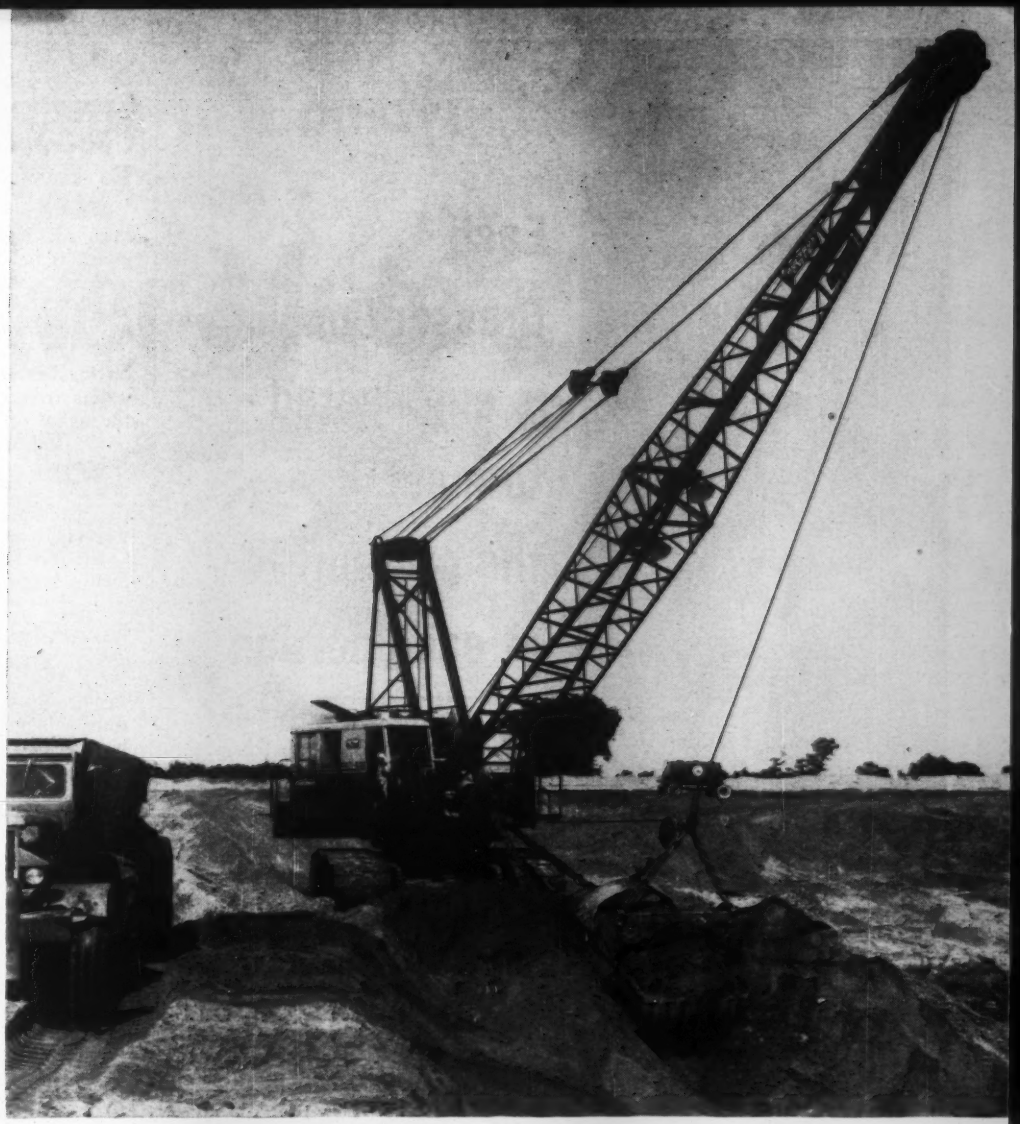
Operation of the factory will provide practical experience for more and bigger sludge reconditioning plants. It will be operated by Emscher Aufbereitungs GmbH, an association of Ruhr district communities.

The process was developed by Hans Arbeit, geologist and research engineer of the Thyssen Co. and manager of Emscher Aufbereitungs GmbH. Since patents are still pending, details have not been revealed. The coal dust will contain about 46% of nonvolatile components but only 1 to 2% water. The dust will be used primarily by power plants with which long-term delivery contracts have already been signed.

The iron oxide will be extracted magnetically and will be used by the mining company Bergwerksgesellschaft Walsum to produce iron coke. Walsum has built a pilot plant with a 500 ton per day capacity. The process makes it possible for the first time to produce blast furnace coke out of long-flame gas coal without using low- or high-volatile coal. Long-flame gas coal is ground and mixed with fine ore dust and 2 to 3% oil to produce iron coke, which is reported to have strength and good smelting qualities.

(*International continued on page 108*)

For draglines, shovels, scrapers, bulldozers—you can't beat Tiger Brand Wire Rope for long, low-cost service.



Changing the face of the nation's highways

with the help of USS Tiger Brand Wire Rope

On most of the big highway jobs, Tiger Brand Wire Rope is doing the heavy work. It supplies the steel "muscles" for shovels, draglines, scrapers and other earth-moving equipment.

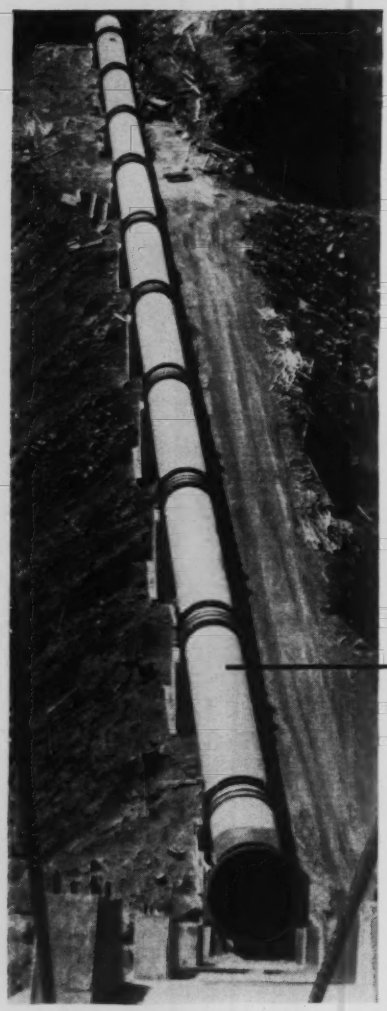
Contractors are large users of Tiger Brand Wire Rope because this rugged steel rope lasts longer, moves more materials, and gets the job done quicker at less cost. Its Excellay Preformed construction makes it easy to handle . . . quick to install. It has less tendency to loop, kink or whip . . . and it offers highest resistance to bending fatigue.

Tiger Brand gives long, trouble-free service because it's made from the best possible steel. From ore to finished product, every step of production is rigidly controlled to guarantee top quality. And the rope is engineered to fit the job —engineered by one of the finest staffs in the country, and backed by the basic research of the United States Steel Corporation. Next time you need wire rope, rig up with Tiger Brand. It will keep your machines on the job. American Steel & Wire Division, Rockefeller Building, Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

American Steel & Wire Division of USS **United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors
United States Steel Export Company, Distributors Abroad



Each Dresser Coupling is engineered to meet the pressure at each portion of the penstock

CALIFORNIA-OREGON POWER COMPANY... another 100% Dresser-Coupled penstock

Near Yamsay, Oregon, you'll find another impressive argument for using steel-pipe penstocks and Dresser Couplings. The line is 100 percent Dresser-Coupled... the only type of joint which could be individually tailored to the pressure requirements at each portion of the penstock.

Up to 25% lighter

The Dresser method saves money by permitting the use of lighter wall, high tensile steel pipe. Weight savings can amount to 25 percent... resulting in lower freight and handling costs, lighter equipment on the job. There are no fussy lining-up operations. The flexibility of the Dresser Coupling compensates for slight misalignments caused by grade variations. With the Dresser method, you get a stress-free line, bottle-tight for life.

If you'd like to see technical data on a number of other Dresser-Coupled penstock installations, write for illustrated brochure. Before you draw up specifications, make sure you have all the facts on steel pipe joined with Dresser Couplings.

Bradford, Pennsylvania
Chicago
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DRESSER MANUFACTURING DIVISION

ONE OF THE DRESSER INDUSTRIES

. . . International

Underground Malaya Plant To Have 1,850 Foot Head

Contractors all over the world have been invited by the Malayan government to bid on a $120 million hydro power scheme in the Cameron Highlands. The project is part of a $268 million, 15 year development.

A 120 ft dam will impound water on the Bertam River, supplemented by waters from the Telom River diverted through 13 miles of tunnel. The main power station will be a 60,000 kw underground plant, 600 ft in rock. Normal lake level will be 1,850 ft above the machine room. There is to be a second powerhouse above ground.

Money for the project has been loaned by the World Bank.

Australian Firm To Build $70 Million Steel Mill

The Broken Hill Party, Ltd., Australia's biggest industrial concern, will build a new $70 million steel plant at Whyalla, South Australia.

Under an agreement just reached with the territorial government, the firm will construct a steel-making plant, rolling mills and associated facilities. At least 1,500 houses will be built for employees by the South Australian Housing Trust, and discussions are under way on construction of a railroad from Port Augusta to Whyalla and a water supply line from Whyalla to ore deposits 30 miles away.

Budget Up As Work Starts On Argentine Power Plant

Work started recently shortly after a contract for the construction of a 600,000 kw power plant at Buenos Aires was approved by the Argentine government. Construction is being done for the Argentine Water and Power Board, by a joint venture, consisting of the British Thompson Houston Export Co. Ltd., and International Combustion Export Ltd.

Total cost will amount to $172 million, with $25 million already allotted.

Panama Canal Bridge To Get Start This Year

Construction is expected to start late this year on a $20 million bridge across the Panama Canal. Plans call for a 11,000 ft long high-level bridge, 201 ft above the canal.

U. S. funds will be used to build the bridge, as agreed to in a treaty signed in 1955 between Panama and the United States.

New Concept in Construction Fastening!

REMINGTON Power-Mate* BASIC UNIT

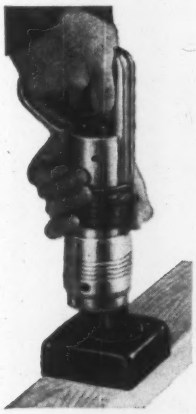
. . . plus choice of 4 interchangeable Stud Driver Kits

K-1. CAPTIVE STUD KIT—designed to prevent free flight of studs when base material is inadequate. Used with "Power-Mate," this is safest Stud Driver ever designed.

K-2. LIGHT-DUTY KIT—produces all-purpose tool. Handles 80% of your fastening in concrete or steel. K-1 and K-2 use ¼" diameter Remington Studs and 22 caliber Power Loads.

K-3. MEDIUM-DUTY KIT permits use of ⅓" diameter Remington Studs with low-cost 22 caliber Power Loads. This assembly gives top performance . . . economically.

K-4. MEDIUM- AND HEAVY-DUTY KIT for toughest fastening jobs. Designed for use with ⅓" diameter Remington Studs and scientifically graded 22 or 32 caliber Power Loads.



Most versatile tool ever designed for fastening wood or metal to concrete or steel

Now you can have the power you want, the stud size you need with the new Remington "Power-Mate." The tool is easy to use. Just a squeeze of the trigger is all it takes to anchor wood or metal sections to concrete or steel. No pre-drilling, no outside power connections required!

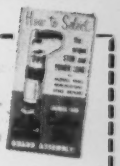
The Remington "Power-Mate" is flexible, too. Permits use of ¼" or ⅜" diameter alloy steel studs and 22 or 32 caliber Remington Power Loads to furnish driving force.

Take the "Power-Mate" Basic Unit, attach the Stud Driver Kit of your choice—and the tool is ready to use! It will handle any fastening job—light, medium or heavy duty. That's why the Remington Stud Driver is the most versatile construction fastening tool ever designed!

Remington® DUPONT

STUD DRIVER

*"POWER-MATE" is a trademark of Remington Arms Company, Inc.



Remington Arms Company, Inc.
Industrial Sales Division, Dept. EN-5
Bridgeport 2, Connecticut

Please send free booklet on the Remington "Power-Mate."

☐ I am especially interested in the Captive Stud Kit.

Name .....

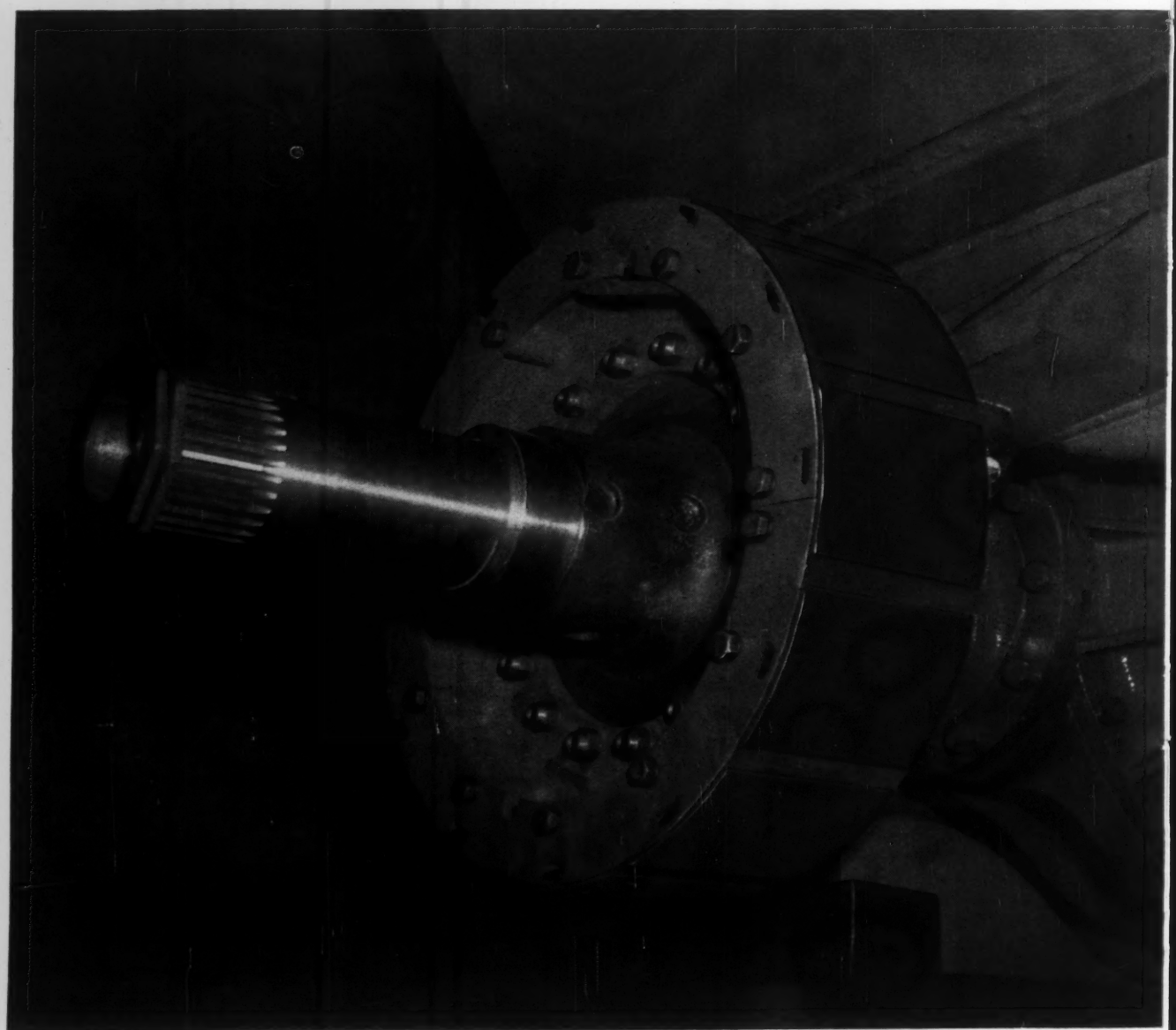
Firm .....*Title*.....

Address .....

City .....*State*.....

New B. F. Goodrich Hi-Torque Brake

THE FIRST AND ONLY WITH FULL-CIRCLE



B.F.Goodrich

OFF-ROAD BRAKE STOPPING POWER

For years B.F.Goodrich wheels and brakes have been landing big commercial and military aircraft. Now, adapting successful engineering design to the heavy duty equipment field, B.F.Goodrich has developed an off-road brake that outperforms other brakes in every case.

It's the B.F.Goodrich Hi-Torque Brake, the *only* off-road brake with reserve capacity to handle the needs of larger and larger equipment. Unlike conventional anchored-shoe brakes that are actuated at only two points, the B.F.Goodrich Hi-Torque Brake actuates with uniform hydraulic pressure under each of *12* shoes.

On-job tests prove that the B.F.Goodrich Hi-Torque stops mammoth equipment up to two and a half times faster than ordinary two-shoe brakes. Operators can reduce cycle time by maintaining higher speeds with safety. In addition, automatic adjustment is provided throughout the life of the linings. Full circle actuation allows shoes to follow drum eccentricities. This equalizes lining pressure—makes braking action smoother—reduces fade. And torque is equal in forward or reverse.

If you build or use trucks, tractors, scrapers or any wheeled off-road vehicles, you'll want to know more about this revolutionary new B.F.Goodrich Hi-Torque brake. It installs quickly, easily—requires only a single hydraulic connection. No lubrication necessary.

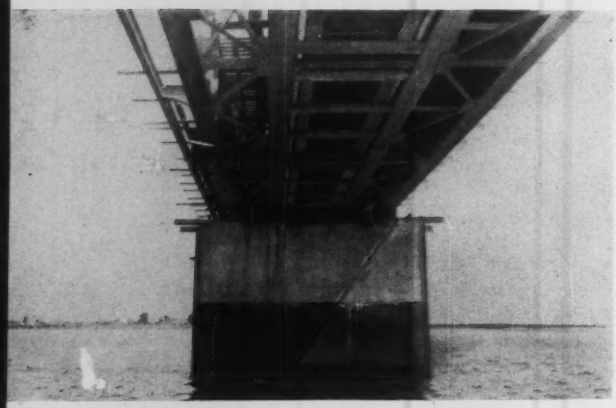
Free descriptive folder—The B.F.Goodrich Hi-Torque Brake—gives actual on-job test results and specifications of typical sizes up to 26" x 7" with torque capacities exceeding 120,000 pound-feet. Write: B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Troy, Ohio.

The B.F.Goodrich Hi-Torque Brake is now standard equipment on the M-R-S 250 Scraper (left) and 550 horsepower M-R-S 250 Tractor, the world's largest rubber tired scraper combination with a capacity of 34 cu. yds. struck and 43.5 cu. yds. heaped. Designed for use with straight hydraulic or air-over-hydraulic systems, the B.F.Goodrich Hi-Torque Brake is already available on other off-road equipment.

B.F.Goodrich Hi-Torque brakes

Jamaica Bay Crossing, serving the Rockaway Extension of New York's Rapid Transit System, has 33,000 sq. ft. of wrought iron plate for protection against salt air and salt water corrosion.

This subway goes to sea over piers protected with 300 tons of Wrought Iron Plate



Protective scale which normally forms on the surface of wrought iron plates provides a long life additive for concrete substructures on this span.

Passenger safety and preventive maintenance account for the wide use of wrought iron for this new four-mile span.

To safeguard Jamaica Bay Span's substructure against marine elements and alternate freezing and thawing conditions, more than 300 tons of ½-inch thick wrought iron plate protects the concrete piers.

In addition, wrought iron electrical conduit guards power lines and air signal lines against foul weather. Topside, on the bridge structure, wrought iron pipe turns in yeoman service in railing applications. Another 175 tons of wrought iron—angles, clips, nuts and bolts—fasten pier plates and anchor wooden pier fenders.

Write our Engineering Service Department for specific information on wrought iron's ability in these services. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

Designed and constructed under the supervision of the New York Transit Authority Engineering Department

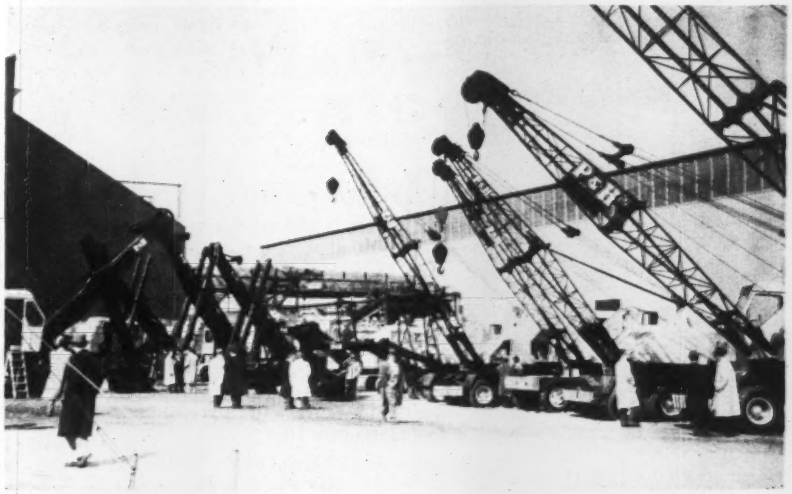
Hardesty and Hanover, Consulting Engineers

American Bridge Company and Merritt-Chapman & Scott, General Contractors

BYERS Wrought Iron Tubular and Hot Rolled Products

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS

Corrosion costs you more than Wrought Iron



Harnischfeger shows off its line and reveals . . .

A Taller Crawler Is Coming

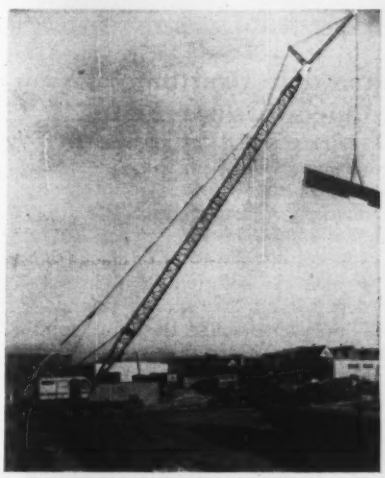
Contractors and equipment men were given a spring preview of heavy construction equipment in Milwaukee last month by the Harnischfeger Corp. Over $1 million worth of shovels, cranes and other earth-handling equipment were demonstrated at the one-day conference. And details of a taller-than-ever P&H crawler crane were revealed.

Harnischfeger's objective in holding the equipment show and plant tour was threefold: To show the contractors its line of shovels; demonstrate its manufacturing facilities and processes; and learn first-hand from the contractor what he needs in the way of new equipment. This was the second of a number of such meetings to be held this spring at the company's 27 acre plant in Milwaukee to show its wares to contractors from various regions of the U. S.

In addition to several models of truck cranes and crawler shovels ranging in price from $15,000 to $120,000, the equipment display included a 2½ yd trench hoe, an elevating loader capable of side casting 2,000 bank yards per hour, and a single-pass soil stabilizer designed to pulverize, blend and process a strip of soil 8 ft wide by 8 in. deep.

Two new models on display and one scheduled to go into production this summer—captured considerable attention of the contractors.

• **Truck crane**—One of the models—the newest and largest of the entire truck crane display—was the heavy-duty, P&H Model 775-TC. It mounts a 160 ft boom with a 40 ft jib and has a rated capacity of 70 tons at a 15 ft radius. It features "Magnetorque" swing, which is a P&H frictionless mechanism that transmits power electromagnetically for swinging the boom. Powered either by gasoline or P&H diesel engine, the 70-ton crane is mounted on an 8-wheel, 4-wheel-drive carrier, 33 ft long, 11 ft wide and 13 ft 4 in. high to the top of cab. When equipped with a standard boom, the rig weighs about 67 tons.



TRUCK CRANE, Model 775-TC, with its 160 ft boom and 40 ft jib has a rated capacity of 70 tons at 15 ft radius. P&H's new crawler will top this by 50 ft.

• **New excavator**—The second newly announced model included in the display was a new P&H 1-cu-yd crawler type excavator, Model 455C. Developed primarily for the construction industry, it has a 25 ton rated capacity when operating as a crane with standard crawlers. It is also offered with a 30 ton rating on long crawlers. Standard equipment includes Magnetorque swing, hydraulic power controls, newly designed electrical system, independent swing and propel power, and a tandem drum for increased cable capacity. Either gasoline or diesel power may be specified.

• **Tallest crane**—Harnischfeger has developed what will be its tallest and biggest crane. Pilot models have been tested and production is scheduled to start this summer.

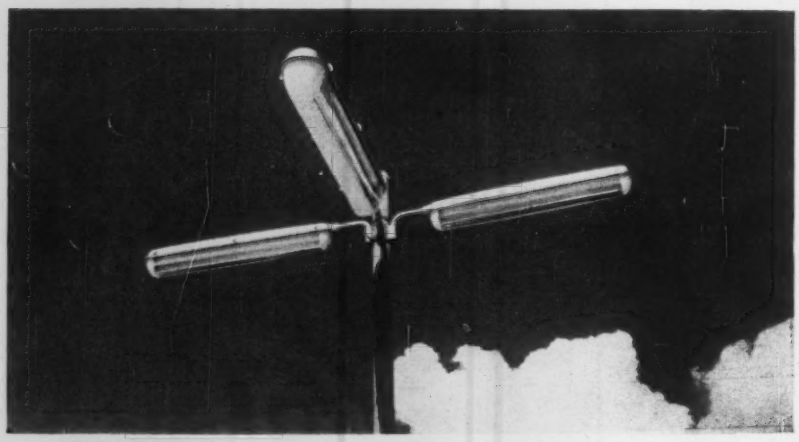
Although no complete model was included in the equipment display, company officials gave the contractors complete design details and performance ratings.

The big crawler crane, Model 1010, will mount either 210 ft of lightweight boom with a 40 ft jib for a total boom length of 250 ft, or 150 ft of heavy duty boom with a 30 ft jib. Using a 50 ft boom it will have a 100 ton rated capacity at 15 ft radius.

This heavy duty full-functioning crawler crane features Magnetorque swing clutches and a mechanical independent propel mechanism actuated by an air-operated clutch. Its removable single-piece counterweight can be lowered by means of the rear drum. Its collapsible gantry when folded into position, provides exceptionally low vertical clearance of less than 13 ft. The all-welded rig is powered by a diesel engine rated at 210 hp under a full load speed of 1,700 rpm.

The crawler frame is 21 ft long, 16 ft 10 in. wide, with 36 in. crawler shoes. This wide-spread crawler together with the frictionless electromagnetic Magnetorque clutch mechanism are the chief factors in the exceptional crane ratings using either the 250 ft lightweight boom or 180 ft heavy duty boom, according to company engineers. Total weight of the crane and standard boom is about 180,000 lb. Ground clearance is 13 in. and tail swing is 15 ft 4 in.

(*New Products continued on page 114*)



TEE-LIGHTING UNITS are installed with 6 ft luminaires mounted parallel to curb with the third unit extending over the pavement in the conventional way.

Integral Highway Luminaires Are Here

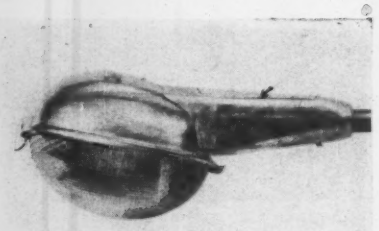
Public officials and highway engineers striving for highway safety, are being offered some new concepts in road lighting by General Electric engineers, whose research teams have come up with new ideas in mercury and fluorescent luminaires.

One of the offerings is a 400 watt mercury vapor street and highway lighting luminaire with a shatterproof acrylic plastic refractor designed to give significant maintenance economies. In addition, the unit may be equipped with a built-in ballast (transformer and current regulator) that manufacturers claim will save up to $50 dollars per pole in its installation, by eliminating the need for separate pole-top ballast adapters and complicated wiring systems.

Designed particularly for use in the "tee-lighting" systems is a unit, believed to be the world's most powerful fluorescent street lighting luminaire—a king-size unit with 6 ft lamps that generate 55,800 lumens of light. Noteworthy in the system is a built in air recirculating system that controls internal temperature to optimum values to give maximum light output.

The "tee-lighting" concept itself has been in operation at the company's test road at Hendersonville, N. C., for over a year, and manufacturer claims it has efficiency greater than any other fluorescent luminaire available.

As an aid to prospective buyers, the manufacturer built a mile long test road, with typical street intersections and both asphalt and concrete pavements. Type and spacing of lights can be tested and compared by the prospective customer, with local conditions and pavement type in use. The testing facility is available to all engineers and public officials who want such tests to confirm their decisions on lighting needs. General Electric Corp., Outdoor Lighting Dept., Hendersonville, N. C.



"POWER PACK" mercury luminaire provides an integrally mounted ballast installed in the elongated slipfitter (arrow).

Untearable Drafting Film Produces Clearer Prints

A drafting "cloth" known as Duracine Tracing Film, said to be so strong as to be virtually indestructible, is on the market. Manufacturers say that this film cannot be torn, is permanent and will not discolor, split or crack from age or heat. In addition, its high transparency will produce clearer reproductions in a short time. Its prime application is in tracings that get frequent handling, although its moderate cost makes it suitable for general drafting room use.

The base material of Duracine is 0.003 in. thick du Pont Mylar prepared with a special surface to hold pencil, ink or typewriter work. Yet the work can be erased and done over in the same area without risk of ghosting, say the manufacturers. In addition, the material is waterproof.

The tracing film comes—coated either on one or both sides—in 20 yd rolls in 30, 36 and 42 in. widths. These also are available in special sizes to order, plain or with printed title blocks. KEUFFEL & ESSER CO., HOBOKEN, N. J.

High Drilling Flexibility With U-Bar Construction

Le Roi's LWD-400 Rock Cruiser, with U-bar construction and large-size air motors is designed for heavy hard-rock drilling in hard-to-get-at places. The drill rig has 6 ft long tracks with rubber cleats. Each track is powered by a 7½ hp air motor.

U-bar construction is said to provide drilling flexibility through a 105 deg vertical boom arc. Drill feed can be placed flat on the ground for toe-hole drilling, 7 ft. above the ground horizontally for breast-hole drilling, and in vertical position for down-hole drilling.

Feed is powered by a double lobe motor; a seven blade rotor provides alternate power from opposed power lobes. A 10 ft feed travel allows 8 ft steel changes; optional feeds allow changes up to 18 ft.

The Rock Cruiser's carriage length, with boom horizontal, is 8 ft 6 in.; with boom vertical, height is 7 ft 3 in. The unit is 6 ft 6 in. wide, with a 2 ft 8 in. clearance through the center.

Available drills include the 3½ in. H23DR, 3½ in. D25DR, and the 4 in. D14DR. LE ROI DIV., WESTINGHOUSE AIR BRAKE CO., MILWAUKEE 1, WIS.

New 70-Ton Truck-Crane Uses High-Strength Frame

A four-axle truck-crane designated the Type 84-T is available in 8x4 and 8x6 carrier drives. One advantage claimed in the design is the exclusive use of high strength T-1 steel in the main frame and frame components.

Other special features reported by the manufacturer of the 70 ton truck-crane include pin-on front and rear outrigger boxes, roller-mounted outrigger beams, full-length deck fender design and full frame width engine compartment. The rotating unit features air control for all motions and fully-enclosed pump-lubricated deck gears.

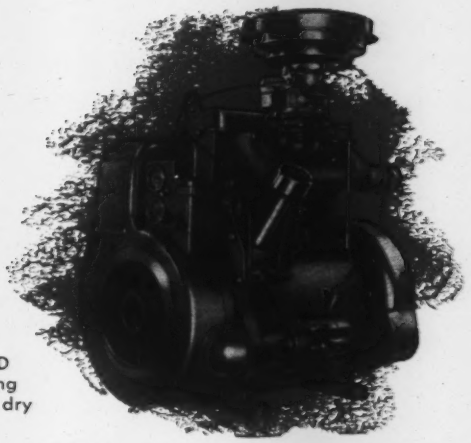
The boom is available with pin or butt-type joints. The 84-T can be equipped with gasoline or diesel power. BALDWIN-LIMA-HAMILTON CORP., CONSTRUCTION EQUIPMENT DIV., LIMA, OHIO.

(*New Products continued on page 116*)

NEW...

POWER-PACKED CHAMPS OF THE AIR-COOLED ENGINE FIELD

by HERCULES



HERCULES C2-90D
Design by Lycoming
35 HP; 274 pounds, dry

HERCULES CV4-180
Design by Lycoming
70 HP; 463 pounds, dry

No other industrial air-cooled engines pack the horsepower/pound of these two- and four-cylinder models. Modern design gives them 40-90% more HP per cubic inch displacement. Add to this high usable power, the economy of these engines . . . up to ⅓ in fuel savings over competitive engines . . . and you've got an unbeatable combination for your equipment power or power-unit applications.

The Hercules industrial air-cooled engines of Lycoming design have the dependability and endurance for which the Lycoming name is famous in aircraft engines. Crankshaft design is oversize and all bearings are of the replaceable type. With overhead valves, "top-overhaul" is fast and simple on these Hercules units; in fact, complete engine rebuild can be accomplished without removing the engine from its mountings.

Lubrication is by force-feed system with the oil fed from the crankcase to the engine's moving parts by gear-type pump through a pressure relief valve.

Available as engines or complete power-units, with accessory equipment to match service conditions, these engines have been refined by Hercules and are backed by Hercules reputation for quality, stamina and engineering excellence. Prompt service is available through Hercules world-wide distributor organization.

For further information, write Hercules Motors Corp., Dept. 100, Canton 2, Ohio. Other Hercules engines from 5 to 475 HP.

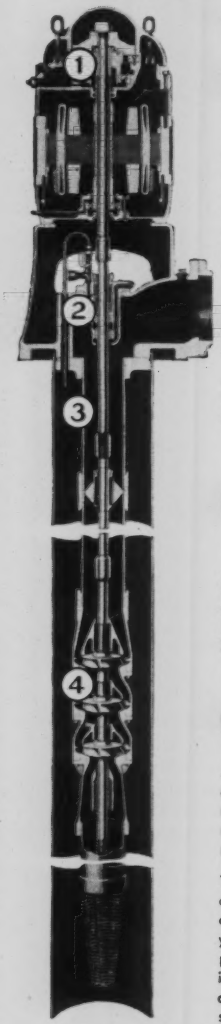
HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

DEMING PUMPS...

Engineered for Longer Life and Low Cost Operation!

NOTE THESE FEATURES:



1 Separate Motor Shaft

...with coupling above the stuffing box to facilitate installation or change of drive without raising the pump or breaking pipe connections.

2 Accessible Stuffing Box

. . . located in pump head for ease in servicing.

3 High Strength Line Shaft

. . . full-size, heat treated steel, precision ground and polished—long-wearing alloy bearing sleeves.

4 Adjustable Impeller Clearance

. . . bronze semi-enclosed impellers are readily adjustable for maintenance of maximum efficiency.

These and the many other Deming features add up to savings that you can't afford to pass up. For complete information clip the coupon below and send it today!

THE DEMING CO.

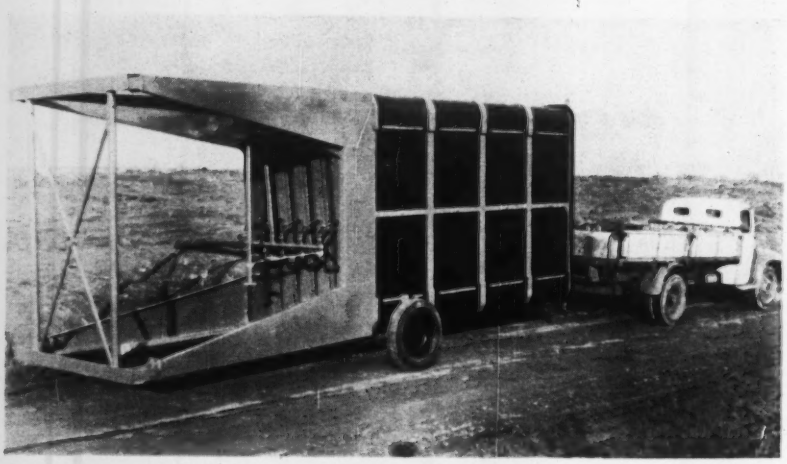
536 Broadway • Salem, Ohio

Please send me complete information on Deming Vertical Turbine Pumps.

Name_____

Address_____

City_____ Zone____ State_____

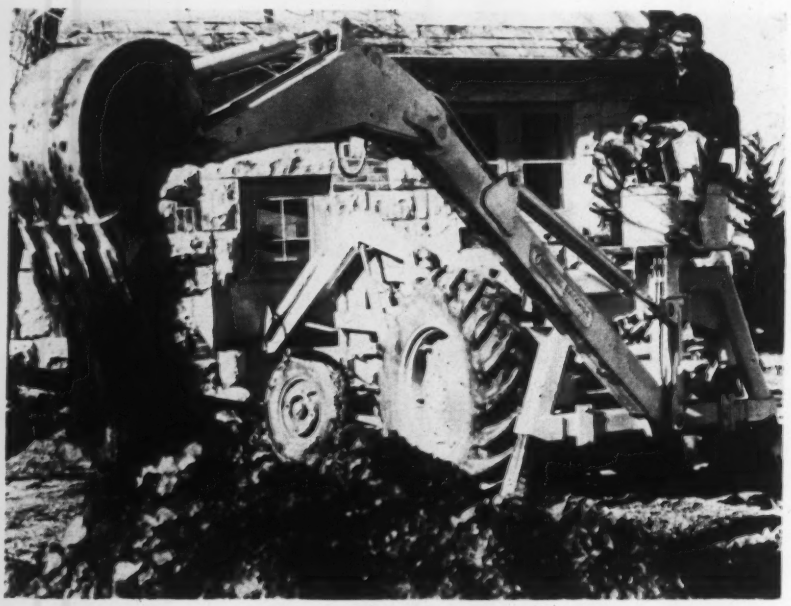


Cement Silo Has Wheels, Will Travel

An English-made, completely mobile cement silo is made of plywood on a steel frame and is claimed to keep dry cement in a usable condition indefinitely. Since it also carries sand and aggregate, it can mix wherever water is available.

The mobile silo has a built-in rotary blower for quick and even discharge of its contents.

The unit is light enough to be towed by a one-ton truck. Road Machines (Drayton) Ltd, West Drayton, Middlesex England.

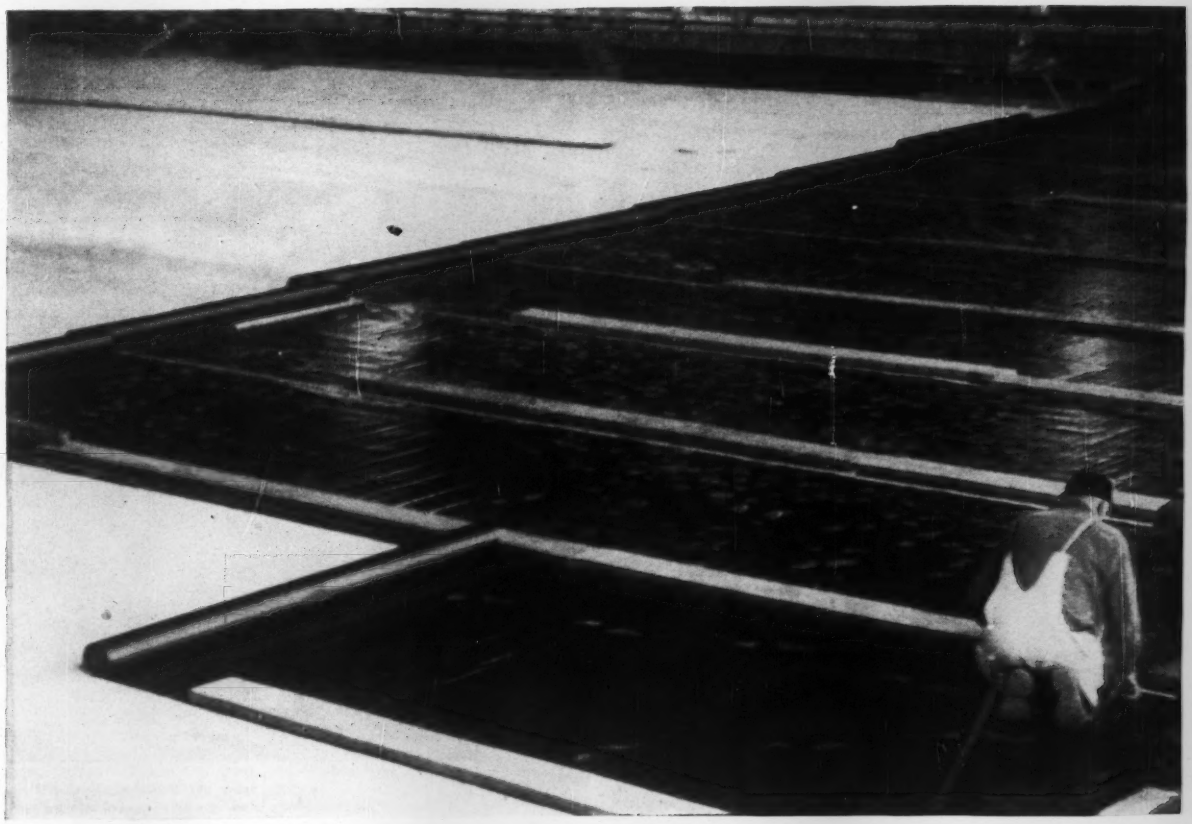


New Backhoe Line Offered at Lower Cost

Ottawa announces a new line of backhoes and front end loaders for various makes and models of tractors at lower cost than previous Ottawa models.

The new Model LX backhoe digs to a depth of 12½ ft in any position of a 190 deg continuous arc of swing, the manufacturer states, and a turret seat that pivots with the boom is offset for greater visibility. The backhoe has reverse-mounted bucket-and-crowd cylinders which are rod-fed to do away with exposed hydraulic lines and hoses.

A patented ejecter bucket, in 14, 18 and 24 in. widths, automatically forces all wet, sticky material from the bucket during dumping, claims the manufacturer. Standard trench and



DRY...FOREVER!

MOISTOP Under Concrete Slabs Prevents Upward Passage of Moisture Through Floors!

If you want a vapor barrier that prevents moisture migration *permanently* — without question — Moistop is your product!

Moistop has all the lasting advantages of polyethylene film combined with the strength of tough, waterproof Sisalkraft for tear-free, fast application.

Moistop gives commercial and residential construction unparalleled moisture-vapor protection when applied under slabs, under basement floors and in crawl spaces.

The cost? Less than 3½¢ per sq. ft.! Available in rolls of 72″, 84″, and 96″ at your building materials supplier.

NOTE: More and more builders are using Moistop also as a low cost concealed flashing.

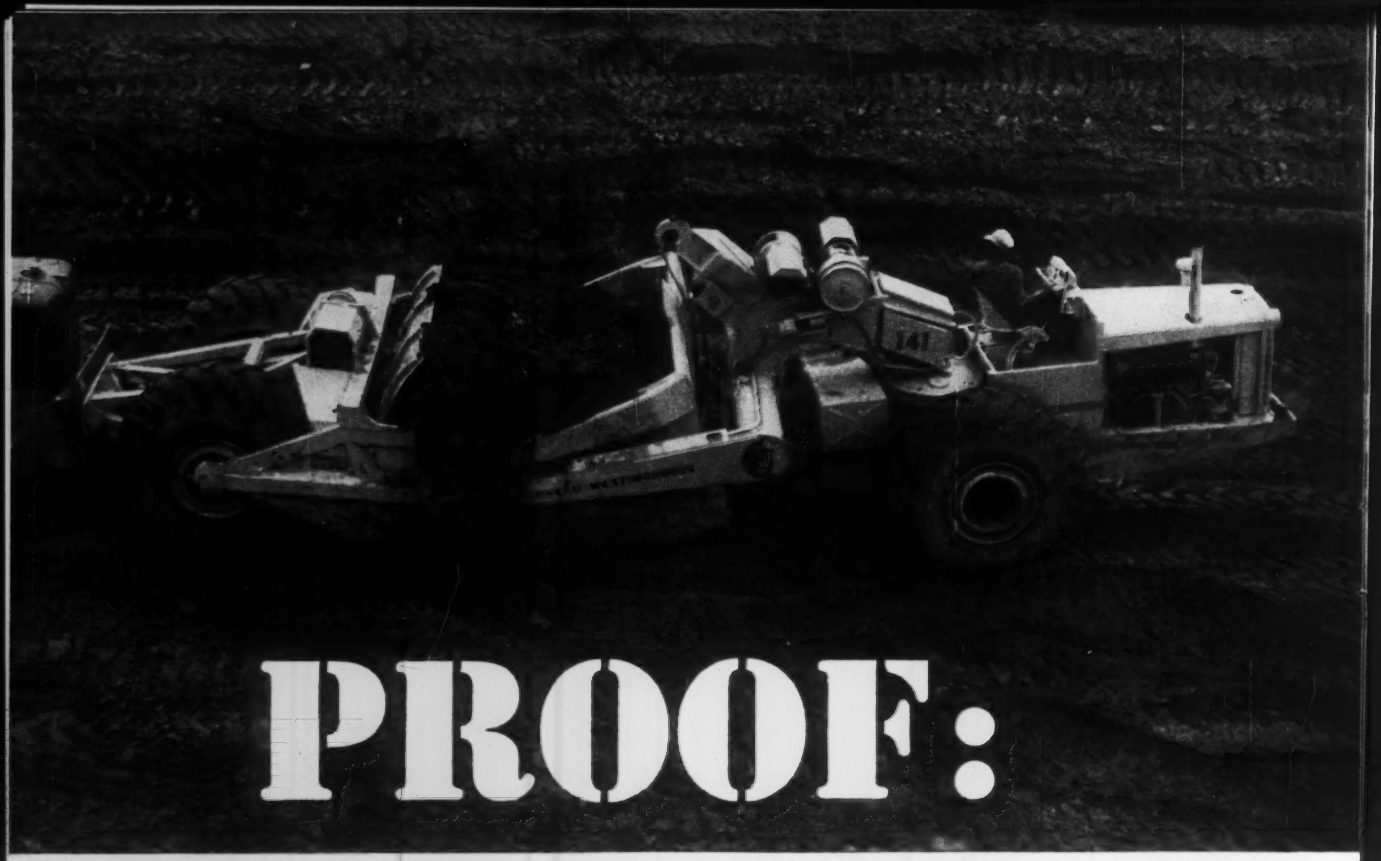
AMERICAN SISALKRAFT CORPORATION

Chicago 6 • New York 17 • San Francisco 5

Other Products in the Sisalkraft Line

ORANGE LABEL SISALKRAFT — Reinforced waterproof paper
COPPER ARMORED SISALKRAFT — Electro-sheet copper • **SISALATION** — Reflective insulation and vapor barrier
VAPORSTOP — Rot-resistant vapor barrier • **SISALITE** — Polyethylene film • **SISAL-GLAZE** — A plastic substitute for glass

SISALKRAFT PRODUCTS ARE AVAILABLE IN CANADA THROUGH ALEXANDER MURRAY & CO., LTD., MONTREAL



PROOF:

16.3% bigger payloads... in 8% less time

Nation-wide time and weight tests prove Fullpaks® load faster, haul more yards

Those are results of a series of weight-time comparison tests just concluded on the LeTourneau-Westinghouse C Tournapull® with 18-yd Fullpak scraper and its predecessor, the 16-yd P-19. The "on-the-job" reports include 121 studies of loading times in 75 locations across the nation (see map). 2,038 loads were timed, 207 weighed.

Overall average load packed in by the C Fullpaks during these tests was 39,030 lbs. Average loading time was 46 seconds. The earlier Tournapulls *without* the Fullpak-type scraper averaged loads weighing only 33,550 lbs—5,480 lbs less. And loading time averaged 50 seconds—4 seconds more.

These were conditions of tests

All equipment in the tests... was "stock," consisting of machines actually owned by, and working for, contractors. Materials ranged from extremely granular sands to heavy plastic soils. A wide range of weather conditions was encountered. And ALL loads timed and weighed were included in final tabulations, from unusually light loads, to exceptionally heavy ones.

Scales used in the tests were four 40,000-lb highway-type Load-O-Meters, fitted into a mobile alloy aluminum platform designed and built by LeTourneau-Westinghouse engineers for faster, more accurate, axle-at-a-time weighing in the field. (See illustration.)

Faster, fuller loading means $$$

16.3% more pay-dirt per trip, loaded in 8% less time, can mean bigger profits to you! Let your LeTourneau-Westinghouse Distributor show you reasons why C Tournapulls with Fullpak scrapers load faster, load more. Call him soon.

Fullpak bowls are lower, wider, to permit nearly horizontal dirt flow. Curved-top tailgate and raised-center sidesheets roll dirt into corners and apron, for better "boil," fewer voids, less spillage. Fast-acting electric control of bowl hoist, apron, tailgate, and steer, boosts speed of entire loading operation. No other scraper equals Fullpak in low-net-cost-per-yard performance.

▲ Weight-and-time tests on scrapers were conducted in 27 states, in District of Columbia, and at Cardston, Alberta. Material weights ranged from 2,370 to 3,105 lbs per yard. Tests are part of continuing LeTourneau-Westinghouse program of checking performance of its equipment in the field.

Four-scale platform built and used by L-W is actually a 1,500-lb 2-wheel trailer. At job site, running gear is removed, and platform imbedded 9" into ground. Engineering tests have shown axle-at-a-time weights more stable and accurate than wheel-at-a-time. Rubber cushion on new L-W platform absorbs shock, spreads load to compensate for variations in brake setting, slight steering pressures . . . insures accurate results.

CP-1837-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Shown: International Furniture factory, Corona, Calif.
Contractor: Oltmans Construction Company, Monterey Park, Calif.
Fifty-eight Rilco laminated beams of various sizes used.

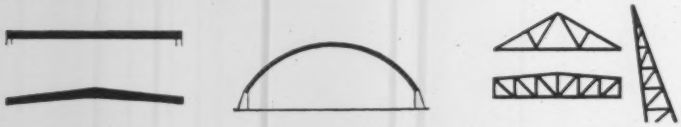
After completing this large furniture factory, the contractor had this to say:

"Our experience in this use of Rilco laminated beams has been most satisfactory. We find that the members are quite easy to handle and erect, and present an excellent finish appearance. The cost is comparable to other common building material used in the same instances, and has certain advantages from the standpoint of construction speed and ease of installing the subsequent materials: rafters, sheathing, etc.

"The use of laminated wood members in commercial and industrial is quite advantageous from the standpoint of fire insurance, (Rilco qualifies as mill type construction.)"

The surprisingly low first cost of Rilco construction is matched by virtually nonexistent maintenance costs, for Rilco members can't corrode or rust, withstand temporary overload or impact without permanent damage. Your own crews erect them saving days and dollars on each job.

Bid lower, build better with Rilco. For more information write your nearest Rilco office.



RILCO LAMINATED PRODUCTS, INC.

RILCO works wonders with wood

W 801 First National Bank Building
Saint Paul 1, Minnesota

DISTRICT OFFICES: Tacoma, Wash. • Fort Wayne, Ind. • Newark, N. J.

undercutter bellhole-grave buckets are available in 18 to 36 in. widths.

The company's Model U loader is designed as a companion tool to the backhoe, and either attachment may be used on a tractor without the other. When both backhoe and loader are mounted on the same tractor, the Ottawa hydraulic system operates both, providing 2,400 lb loader lifting capacity, with 3,500 lb breaking and 7,000 lb digging force at the cutting edge of the backhoe bucket, states the manufacturer.

One lever controls all loader action and two levers control all movements of the backhoe boom and bucket. Ottawa Steel Div., Young Spring & Wire Corp., Ottawa, Kan.

Air-Motor Jack Designed To Lift 25 Ton Loads

A 25 ton capacity jack, the 1725-R, is available for use in railroad repair shops, on construction jobs and in general construction use.

According to the manufacturers, the model can lift heavy truck bodies and industrial equipment at savings of up to 90% in jacking time. Being equipped with trundling handle and large semi-pneumatic tires makes the jack easily movable. Power is supplied by a heavy duty Ingersoll-Rand air motor.

A toe lift that can be quickly slipped in place increases the efficiency in lifting loads too low for the jack's standard lifting cap. Other features are spur gearing, antifriction bearings, pressure lube fittings, automatic shut-off at ends of rise and positive safety controls.

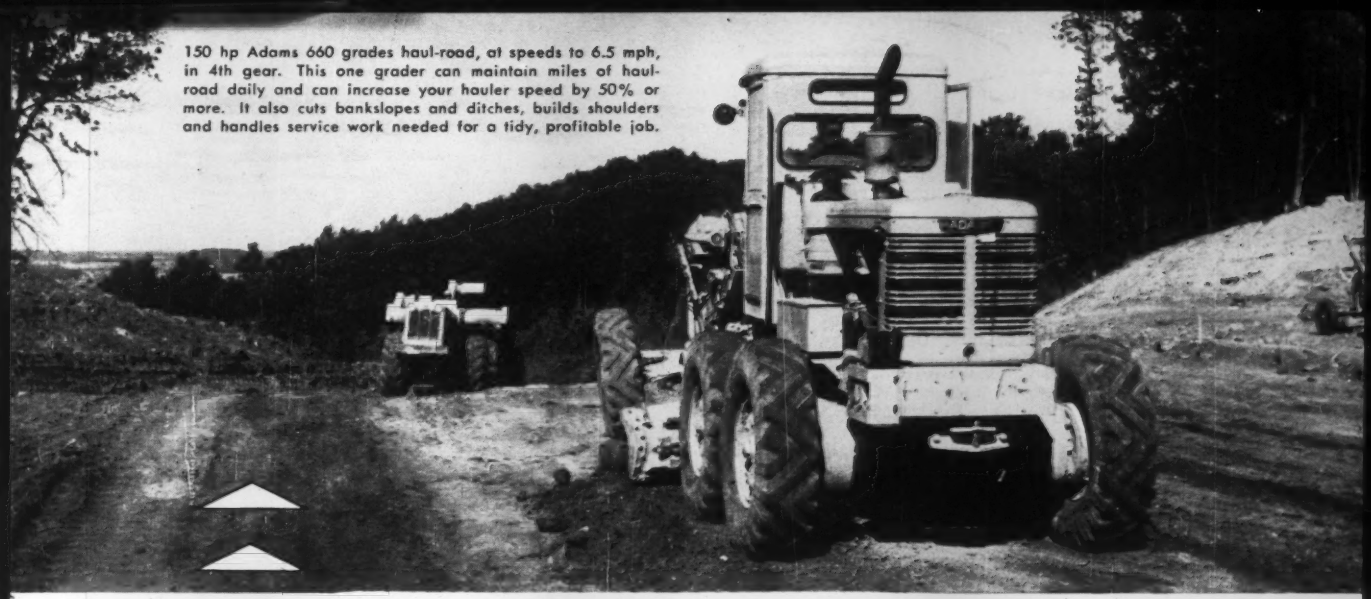
Approximate list price, including toe lift, is $685 with immediate delivery possible. Models are available to 100 ton capacity. Jack Div., The Joyce-Cridland Co., 2027 E. First St., Dayton 3, Ohio.

Two Power Take-Offs From One Engine

One engine where two formerly were required is the cited advantage of the off-plant Series F, D337 engine. Rated at 310 maximum hp, it has a power take-off at both the front and rear of its crankshaft, one for direct power and one for generating electrical power.

This combination, mounted on a common base, is recommended for such uses as rock crushers, where mechanical energy is needed for powering jaw and drum crushers and electrical energy for conveyors, screens and elevating wheels. Caterpillar Tractor Co., Peoria, Ill.

(*New Products continued on page 123*)



150 hp Adams 660 grades haul-road, at speeds to 6.5 mph, in 4th gear. This one grader can maintain miles of haul-road daily and can increase your hauler speed by 50% or more. It also cuts bankslopes and ditches, builds shoulders and handles service work needed for a tidy, profitable job.

How haul-road maintenance can increase your profits

The hauling phase of your scrapers or trucks accounts for the largest percentage of time on most dirtmoving cycles. With a planned haul-road maintenance program — handled by 1 man, 1 grader, a few hours each day — you can cut cycle time and add bonus dollars to your profits. Here's why:

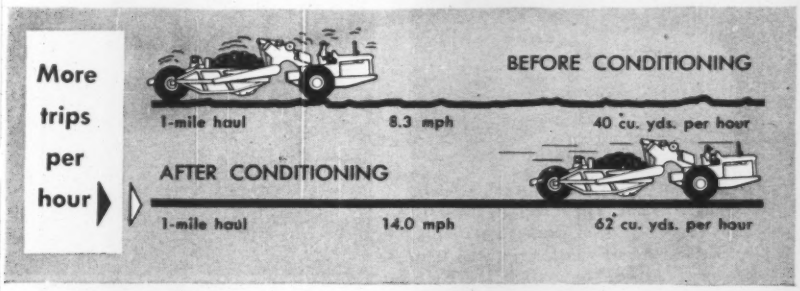


Diagram shows how regular maintenance on a 1-mi. haul-road permits scraper to travel 69% *faster*. Result: more trips, for a production increase of 55%, or 22 yds. per hour.

At pay of only 30c per yard, for example, the scraper hauling on the maintained road earned an extra $6.60 per hour. Multiply this by a fleet of 6 scrapers, 10 hours a day, 6 days a week, and you have a "bonus" of $2,376 per week. So haul-road maintenance doesn't really cost — it *saves* and *earns* for you!

Prolongs equipment life

In addition to increased production, haul-road maintenance also prolongs the life of your equipment fleet . . . lowers servicing and repair costs, and downtime. Take tires alone — damaged from sharp objects, chuckholes, etc., due to poor haul-road maintenance — can cost you thousands of dollars per year for recaps and replacements. All mechanical parts of your haulers are similarly subjected to extra stress and wear. For a fraction of the cost of extra servicing and increased depreciation due to hauling over rough haul-roads, you can easily pay cost of 1 man, and 1 grader to keep these roads hard, smooth, level, and well drained. Also, your maintenance grader can help out with other grading, sloping, and ditching jobs — keeps profitably busy at all times.

High operator efficiency

Your operators will work more relaxed, less fatigued, when traveling over smooth haul-roads. That means they work faster, steadier . . . more productively, all day long.

More grader for your dollar

When planning the purchase of a grader, it will pay you to investigate Adams* heavy-duty motor graders, built by LeTourneau-Westinghouse. All 6 Adams models (60 hp to 190 hp) give you a wider range of power and speed than competitive graders of comparable weight and horsepower. They can push bigger, heavier loads . . . make deeper cuts faster . . . finish-grade more accurately. Choice of GM or Cummins engines on 5 larger models. The largest and most powerful is the 190 hp POWER-*Flow** 660, with torque-converter drive. Write for a demonstration. No obligation.

*Trademark G-1546-DC-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

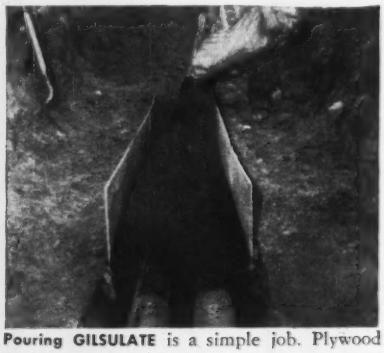
Where quality is a habit

Building "A Case for the future"

Cleveland's Case Institute approves GILSULATE® for underground hot pipe insulation

Major Expansion Program at Case Institute, leading Midwest technical center, includes plans for several new buildings. GILSULATE has been used and approved by Case on these projects.

300-Foot Replacement Line for existing buildings. Case is replacing all lines with GILSULATE. Thus far, 1900 feet of GILSULATE-protected steam and return lines are on the Case campus.



Pouring GILSULATE is a simple job. Plywood forms conserve material. This is a close-up of the pipe run shown at the left. No special equipment is required during handling.

Shovel Pointing works GILSULATE between and under the pipes, filling all the voids. GILSULATE is ideal for use under roads and pavements, has a high load bearing capacity.

Tamping is the next step. It firms the GILSULATE bed prior to curing. Backfilling, seen in the overall view, is the final step. Few men are needed on a GILSULATE job.

Two-year-old Line on Case campus, dug up for experimental purposes, shows pipes to be in perfect condition, with intact GILSULATE protective structure.

Facts about Gilsulate

1. EASY TO USE—just pour and tamp...pipe heat does the rest.
2. FORMS 3 ZONES of protection against heat loss and all hazards commonly encountered by hot buried pipes.
3. NEEDS NO HOUSING OR MECHANICAL SHEATHS: no mixing, special handling or equipment.
4. ONLY NEEDS NORMAL PIPE SPACING: for multiple pipe or cramped conditions.
5. THREE TYPES AVAILABLE:
   Type A for 220°-300°F temp. range
   Type B for 300°-385°F temp. range
   Type C for 385°-520°F temp. range

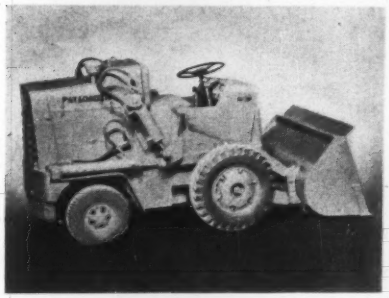
GILSULATE®

The Triple Zone Insulation System for Lifetime Protection of Underground Hot Pipes

For complete information on GILSULATE Insulation, write any of our offices:

AMERICAN GILSONITE COMPANY
Affiliate of Barber Oil Corp. & Standard Oil Co. of Calif.
134 West Broadway, Salt Lake City 1, Utah
3537 Lee Road, Cleveland 20, Ohio
Distributors in principal countries of the world

Do you receive PIPE INSULATION NEWS? Ask to be put on our mailing list.



Tractor Shovel Offers Operating Ease

A new rubber-tired, tractor shovel with a capacity of 2,500 lb, embodies a number of new features and is designed to give greater production and easier operation, according to its manufacturer.

Among the innovations is a power-shift transmission and a torque-converter–matched to give maximum speed and operating ease, with the transmission being full-reversing with two speeds.

The new tractor shovel is available with either gasoline, diesel or liquified petroleum gas powered engines which are rated at 44 hp.

For handling dense materials, the H-25 model has a breakout force of 4,500 lb and provides a bucket tip-back of 40 deg at ground level. A filtered hydraulic system helps take care of dust.

Interchangeable front-end attachments include pick-up sweepers, hydraulic grab devices, crane hook, tine buckets, scrap buckets and blade snow plows. The Frank G. Hough Co., 772 Seventh Ave., Libertyville, Ill.

Rotary Air Compressor Keeps Its Speed Down

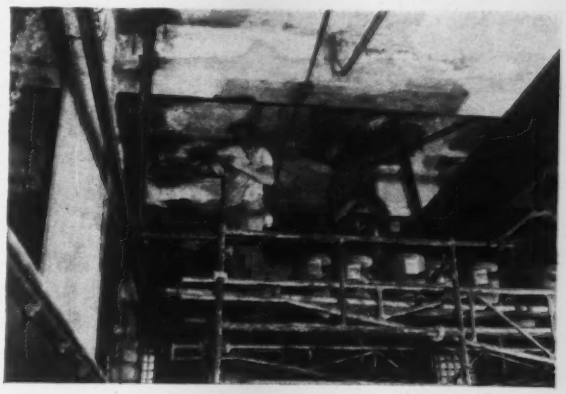
A 365 cfm rotary air compressor with a compressor speed of 1,100 rpm is a portable, two-stage, oil-cooled, sliding-vane type compressor rated at 365 cfm of free air compressed to 100 psi.

The 365RD2 weighs 7,010 lb, is 10 ft 5 in. long, 6 ft 8 in. wide and 7 ft 4 in. high. The instrument panel, including all operating switches and gages, is located above the clutch level. The compressor is coupled to a GM471 diesel engine with a hydraulically actuated clutch, and engine speed at rated output of compressor is 1,650 rpm. A 100% capacity control matches air supply to air demand within a pressure range of 10 psi, according to the manufacturer. Le Roi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.

How THORITE and THOROSEAL made this underground structure sound again!

Workmen prepare old surface for patching with THORITE.

Water has entered the concrete and caused corrosion of reinforcing rods, blistering the concrete off surface and causing structural weakness throughout building.

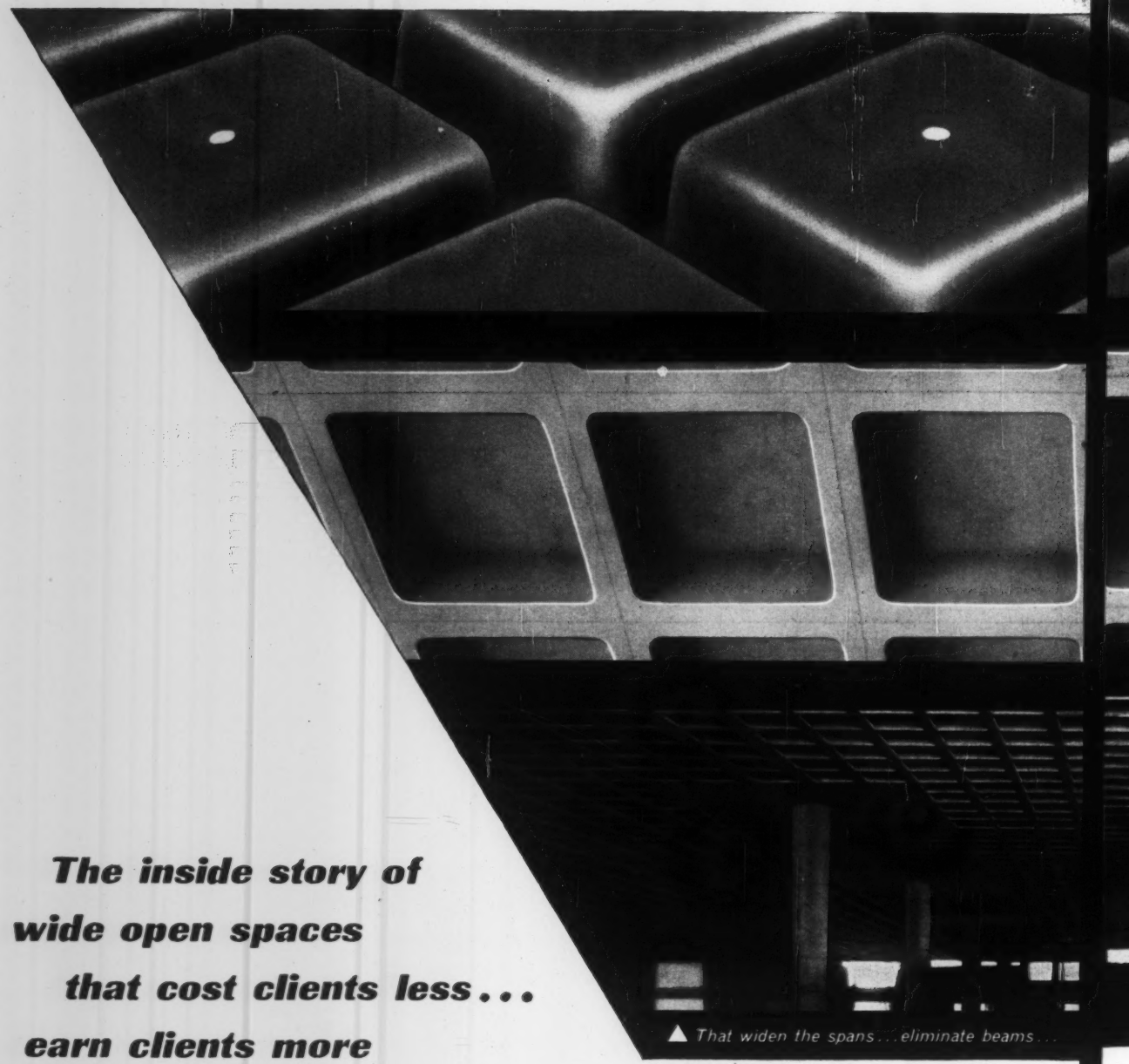


Reinforcing was cleaned, all corrosion was removed and brush coat of THORITE applied over entire patching area, then filled in with trowel coats of THORITE, even with surrounding surfaces.

THORITE Patching Mortar sets in 20 to 30 minutes and can be coated with THOROSEAL while hardening.

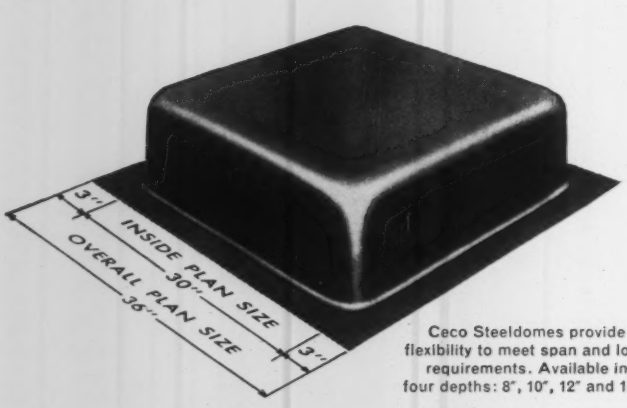
"How to do it" GET OUR 16 PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.



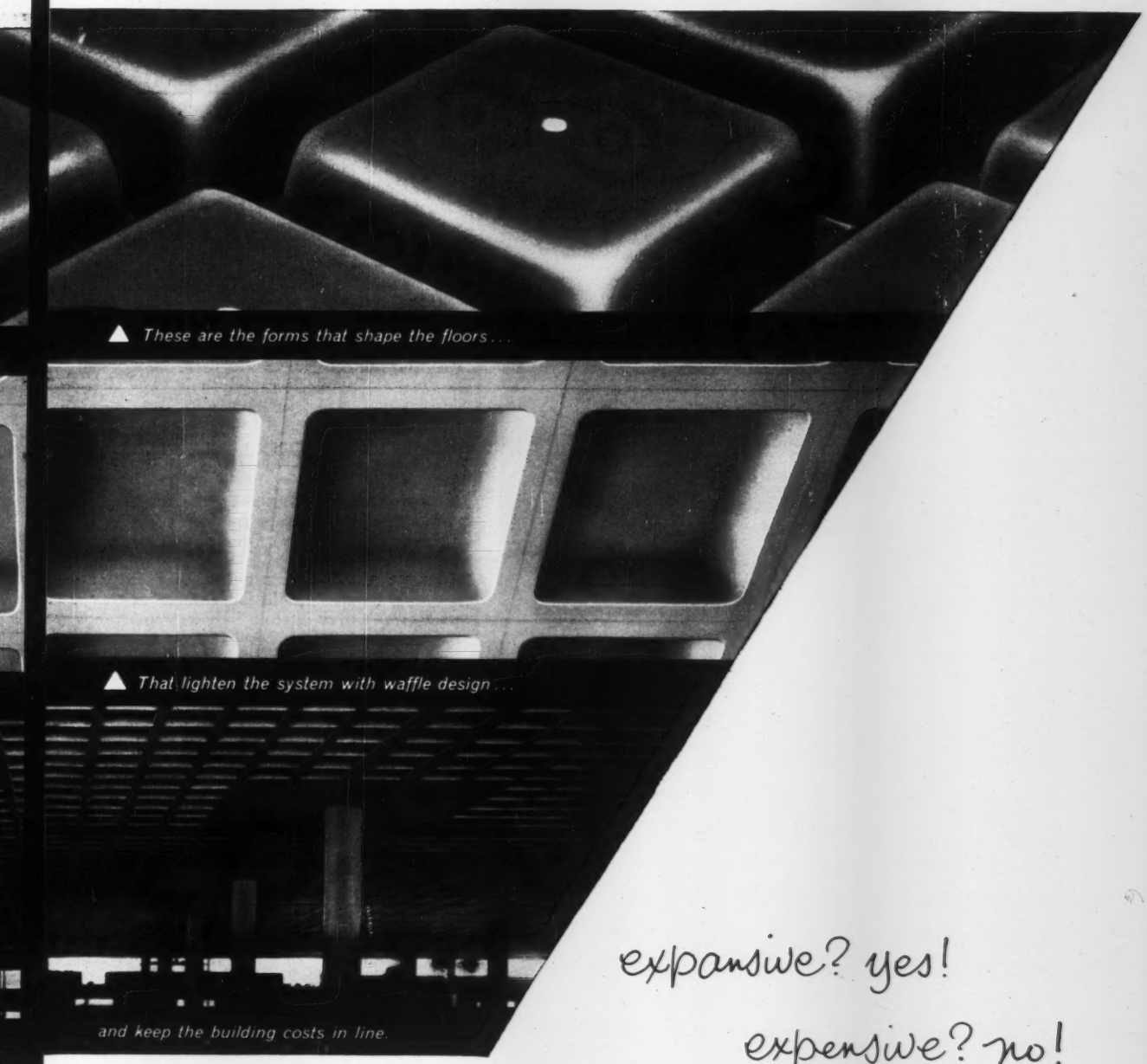
▲ *That widen the spans . . . eliminate beams . . .*

The inside story of wide open spaces that cost clients less . . . earn clients more



Ceco Steeldomes provide flexibility to meet span and load requirements. Available in four depths: 8", 10", 12" and 14".

CECO'S ONE-PIECE STEELDOMES TELL THE TALE . . . Architects and engineers are always seeking ways to span wider areas at lower costs . . . to design buildings that offer the highest return to the client. Ceco offers a solution: Two-way dome construction, using one-piece Steeldomes. Result: Fewer columns . . . uniform ceiling heights . . . no flared heads . . . no drop panels . . . more unobstructed areas for owners to use. The spans are expansive—but not expensive.



▲ *These are the forms that shape the floors . . .*

▲ *That lighten the system with waffle design . . .*

and keep the building costs in line.

Savings in material and time are assured by the two-way design. And there is no higher quality concrete finish than provided by Ceco Steeldomes removed by compressed air. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE... Steelforms / Concrete Reinforcing Steel Joists / Metal Roof Deck / Windows, Screens, Doors / Cecoframe Buildings / Metal Lath

CECO STEEL

expansive? yes!

expensive? no!

WRITE TODAY—WRITE NOW!

ENR

CECO STEEL PRODUCTS CORPORATION
5601 West 26th Street, Chicago 50, Illinois
Please send catalog No. 4007 covering Ceco Steeldome construction.

name_____

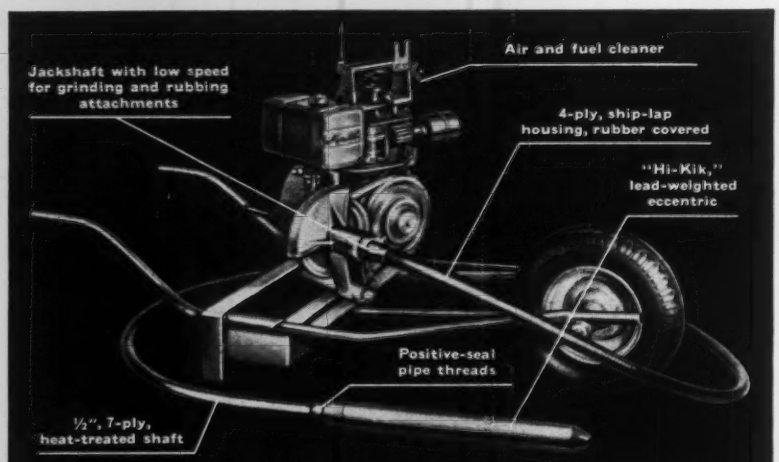
position_____

firm_____

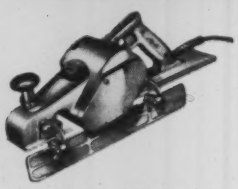
address_____

city_____ **zone**_____ **state**_____

POWER to boost job efficiency with REMINGTON tools

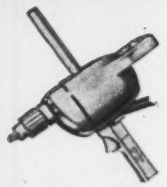

Jackshaft with low speed for grinding and rubbing attachments
Air and fuel cleaner
4-ply, ship-lap housing, rubber covered
"Hi-Kik," lead-weighted eccentric
Positive-seal pipe threads
½", 7-ply, heat-treated shaft

Concrete Vibrator, Model 7GVW—5-hp; speed: 7,500-10,000 vibrations per minute; rugged shaft, housing and big 20" vibrator head. From a complete line of air, electric or gasoline-driven vibrators with a wide range of head sizes.



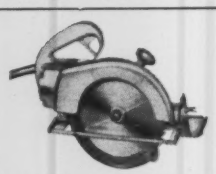
Pizner, Model 3P—Sealed transmission and bearings; 3" width; depth adjustable, 0-⅛"; full-grip rear handle with trigger switch; 8.4 amp, AC/DC motor. Speed: 13,500 rpm.

Pneumatic Chain Saw, Model 2P—Heavy-duty; 18", 24" or 30" bar; roller bearing nose for fast cutting, longer bar life; automatic motor oiler; trigger throttle in hand grip.

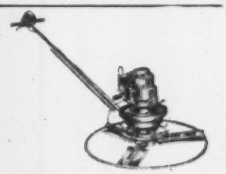


Electric Drill, Model 125—½" capacity; geared key-type chuck; 5-amp motor; removable auxiliary handle; ball and needle bearings; weight: 8½ lbs.; free speed 500 rpm.

Powerful, rugged, easy to handle—Remington Power Tools help you boost output and ease the tough jobs. They're precision-built for long service and minimum maintenance. Your Remington distributor stocks and services the industry's widest selection of power tools and parts.



Electric Saw, Model 106—10" blade; 13-amp motor with powerful worm drive; cuts full 3⅜"; complete with combination blade, wrench and steel carrying case.



Power Trowel, Model TG4-36—2¼-hp, 4-cycle, gasoline-powered engine; 36" ring size; automatic-recoil starter; centrifugal clutch disengages at idle; safety throttle control.

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Publications

Power roller—A 2 page illustrated specification sheet deals with the 1½ ton Model 150 power roller with center-pivot steering. MIDLAND PRODUCTS CO., MIDLAND PARK, N. J.

One-man trencher—A one-man-operated trencher for gas or water line trenching, among other jobs, is described in an illustrated 4 page bulletin. ARPS CORP., NEW HOLSTEIN, WIS.

Electric crane—An all-electric deck crane is illustrated and discussed in a two-color folder. R. G. LETOURNEAU, INC., 2399 S. MACARTHUR, LONGVIEW, TEX.

Crane film—"Run Crane, Run" is the title of a 25 minute, 16 mm, sound-color film highlighting design and operating features of a new crane. THEW-SHOVEL CO., LORAIN, OHIO.

Road boring—A well-illustrated, 20 page brochure points up the advantages of road boring over ditching. It contains a table of minimum bore and encasement pipe sizes recommended for various lines. Title is "Road Boring and Tunneling." BORTUNCO, P. O. Box 14214, HOUSTON, TEX.

Clearing blade—A tree-and-windrow shearing blade is described and illustrated in a 6 page booklet. ROME PLOW CO., CEDARTOWN, GA.

Flasher lights – Specifications, service and maintenance data are included in a 28 page illustrated catalog on generators and flasher lights. Information on how to select a generator for specific applications also is presented in the catalog. PACIFIC MERCURY, 14052 BURBANK BLVD., VAN NUYS, CALIF.

Shovel-crane—Catalog No. 2553 is a 24 page, illustrated description of the 1 yd LS-98 shovel, crane, dragline and hoe. LINK-BELT SPEEDER CORP., CEDAR RAPIDS, IOWA.

Insulation properties—A table on comparative characteristics of cable insulations and descriptions of their properties are presented in a 12 page booklet. BOSTON INSULATED WIRE AND CABLE CO., 65 BAY ST., BOSTON 25, MASS.

Wood pallets—"Care for Wooden Pallets Can Control Maintenance Costs To You," a 15 page booklet, outlines ways to prevent damage and how to care for pallets. NATIONAL WOODEN PALLET MANUFACTURERS ASSOCIATION, BARR BUILDING, WASHINGTON 6, D. C.

(*Publications continued on page 128*)

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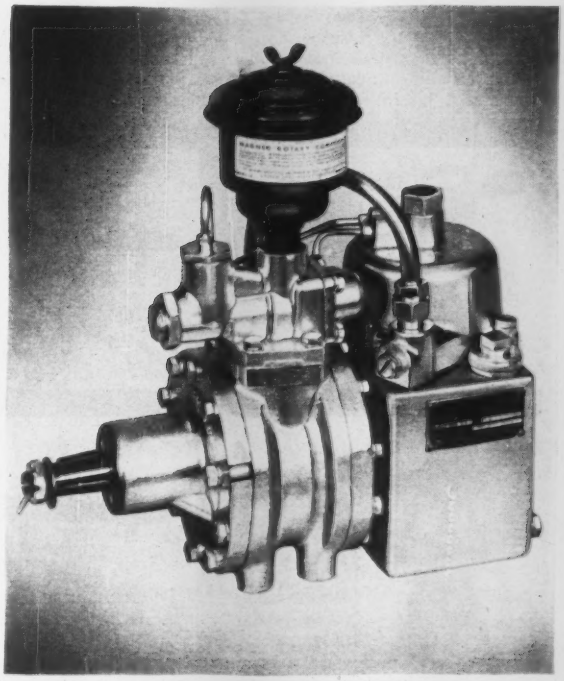

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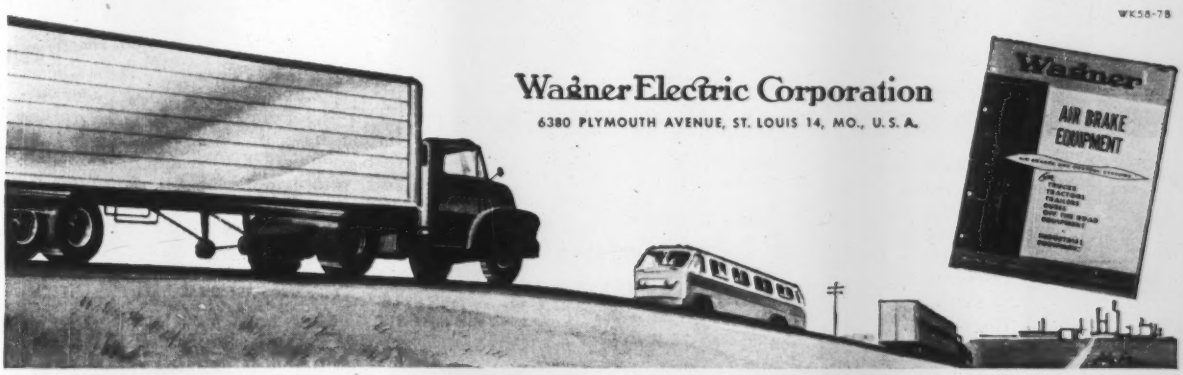

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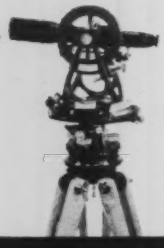
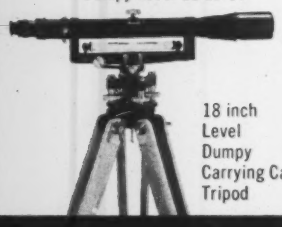


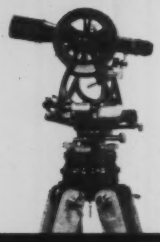
Transit 6T1-CT
...6T20-CT

6 inch
Transit
1 Minute or
20 Seconds
Carrying Case
Tripod



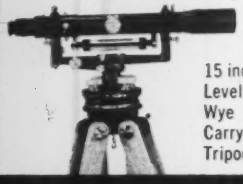
Dumpy Level 18 LD-CT

18 inch
Level
Dumpy
Carrying Case
Tripod



Transit
5T1-CT

5 inch
Transit
1 Minute
Carrying Case
Tripod

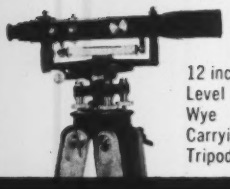


Wye Level 15 LW-CT

15 inch
Level
Wye
Carrying Case
Tripod

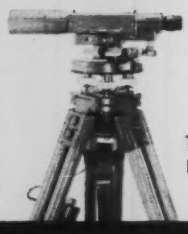
Transit
4T1-CT

4 inch
Transit
1 Minute reading
Carrying Case
Tripod



Wye Level 12 LW-CT

12 inch
Level
Wye
Carrying Case
Tripod



Tilting Level
No. PTL-1A

Transit Level
TL 24-CT

Write for complete catalog of Path Instruments. Ask for Catalog No. 100. Precision Instruments Inc., 1900 Fifth Ave., Troy, N. Y.

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. . . Publications

Aggregate driers—A four-page bulletin deals with maintenance of the combustion chamber of asphalt plant aggregate driers. It describes how through use of special refractory coatings, high temperature patching mortars and preventive maintenance, appreciable economies can be enforced. SAVERITE ENGINEERING CO., 158 14TH ST., HOBOKEN, N. J.

Crawler tractor—Operating and engineering features of the HD-6 diesel powered crawler tractor are described in a 14 page, color illustrated catalog, the MS-1251. Graphs and charts plus a cutaway view of the entire tractor are included. CONSTRUCTION MACHINERY DIV., ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.

Bottom-dump—Design features of the TW-360 bottom-dump motor wagon are included in a three-fold, two-color illustrated catalog, MS-1269, which also carries action photographs and specifications. CONSTRUCTION MACHINERY DIV., ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.

Film on tractor-scrapers—A 16mm, 22 min color-sound movie highlights the design and operating features of the Michigan line of tractor scrapers. The film, called "Bonus Loads" shows the Model 110, 210 and 310 working on job sites. The narration describes the tractor scraper's features. CLARK EQUIPMENT CO., CONSTRUCTION MACHINERY DIV., PIPESTONE RD., BENTON HARBOR, MICH.

Self-propelled crane—AB-158, a four-page, two-color illustrated bulletin, features 12 money and labor saving applications of the Model CR-35 self-propelled crane. SCHIELD BANTAM CO., WAVERLY, IOWA.

International Harvester—The company has put out catalogs on a number of its machines. CR-630-H deals with the TD-14 diesel tractor; CR-629-H, the 55.7 drawbar hp TD-9 diesel crawler tractor; CR-631-H, the TD-18 diesel tractor; CR-628-H, 43.2 drawbar hp TD-6 diesel crawler, CR-617-H, turbotorque diesel power unit. CR-601-H is a 16 page booklet that describes, in text and photographs, roadbuilding from clearing to ribbon cutting. INTERNATIONAL HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

Hydraulc excavators—Specifications and illustrations deal with a full line of hydraulic excavators ranging from $\frac{1}{8}$ to $\frac{1}{2}$ yd capacity. WARNER & SWASEY CO., CLEVELAND, OHIO.

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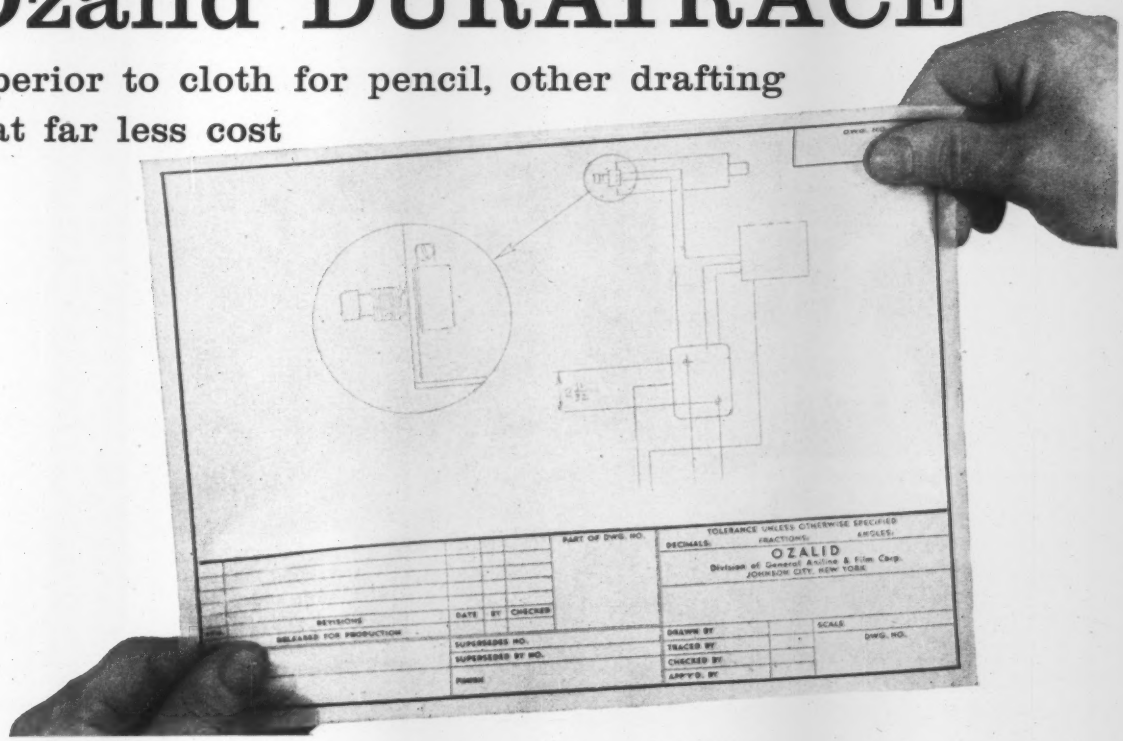

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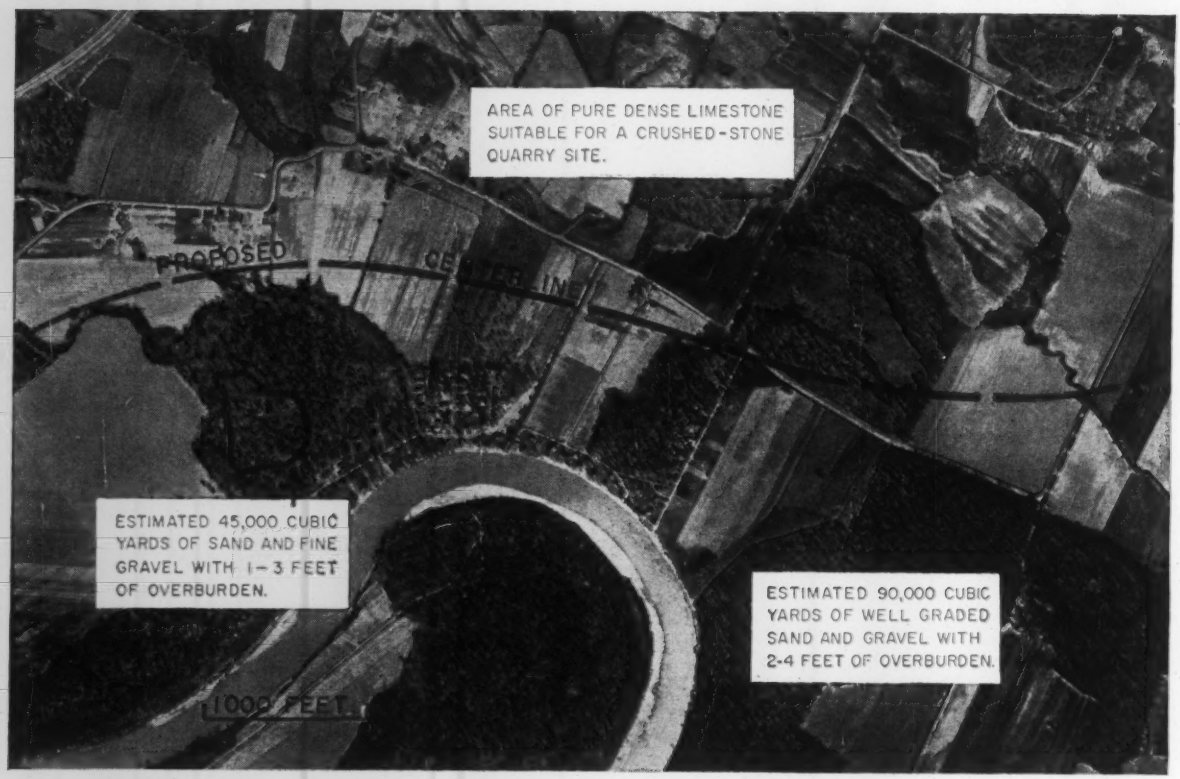
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Pay for Extra Work

Necessity of written order may be waived

A general contractor, who has authorized a subcontractor to perform extra work, cannot prevent the latter from recovering for the extra work on the ground that the authorization was oral and should have been in writing.

In discussing the issue, a Pennsylvania court indicated that a contrary ruling would work an injustice on the performing party.

In that case, a subcontract for construction of a shopping center contained the following provision:

A contract for the construction of a shopping center contained the following provision:

"Without invalidating this contract the Contractor may add to or reduce the work to be performed hereunder. No extra work or changes from plans and specifications under this contract will be recognized or paid for, unless agreed to in writing before the extra work is started or the changes made, in which written order shall be specified in detail the extra work or changes desired, the price to be paid or the amount to be deducted should said change decrease the amount to be paid thereunder."

The contractor contended that during the progress of the work he was directed by the general contractor's superintendent to perform some extra work and to supply additional material, the superintendent assuring the subcontractor that such orders did not need to be in writing despite the provision in the contract.

The general contractor refused to pay for the extra work, whereupon the subcontractor brought an action for recovery.

The trial court dismissed the action on the ground that since it was based on oral orders which were excluded by the terms of the contract, the complaint failed to state a cause of action. This judgment was reversed by the appellate court[1], and the complaint reinstated and remanded for trial.

The appellate court stated: "Even where the contract specifically states that no non-written modification will be recognized, the parties may yet alter their agreement by parol negotiation. The hand that pens a writing may not gag the mouths of the assenting parties. The pen may be more precise in permanently recording what is to be done, but it may not still the tongues which bespeak an improvement in or modification of what has been written."

The court referred to several Pennsylvania cases where the courts have held that even where a contract contains a provision similar to that in this case, it can be changed orally.

In one case,[2] the court stated: "Parties may, by subsequent oral agreement, modify a written contract which they previously entered into. The new contract thus agreed upon is a substitute for the original one in so far as it alters, modifies, or changes it."

The law is almost universal that under contract provisions similar to the one in the case above referred to, where the owner or his authorized agent directs the performance of extra work without a written order, such action constitutes a waiver of the requirement of a written order. In the instant case, the appellate court held that it was up to the trial court to determine whether the superintendent was the agent of the general contractor.

(1) Wagner v. Graziano Construction Co., 136 A. 2d 82, Supreme Court of Pennsylvania, Nov. 18, 1957.
(2) Knight v. Gulf Refining Co., 311 Pa. 357, 360, 166 A. 880, 883.

State Income Tax Covered By a Cost-Plus Contract

A cost-plus contract that allowed the contractor recovery for all expenses incurred in the performance of a contract has been held to cover a state income tax incurred by the contractor because of the contract.

The ruling was handed down by the U. S. Circuit Court of Appeals under the following circumstances.

A contractor performing work under a cost plus contract brought an action against the owner to recover the amount paid by it under the Indiana Gross Income Tax Law. The contract provided that the contractor would be paid for the "net cost" of the work, plus a fixed fee covering overhead and profit and a fixed equipment rental. The contract defined "net cost" as follows: "It is mutually agreed that the net cost of the work shall include all expenses incurred by contractor which are directly chargeable to the work, and that said net cost of the work shall, without restricting the generality of the foregoing, include the following items: * * * Amounts required by any federal, state or local taxes applicable to the work, including old age benefit and unemployment taxes."

The work was to be performed in the state of Indiana and the contractor had to pay the State of Indiana the sum of $31,529.55 as income taxes in connection with the work done. The contractor listed this amount as an item of cost under the contract and on the refusal of the owner to pay the item brought an action to recover for it. The trial court granted the contractor a judgment which was affirmed on appeal.[1]

The owner contended that the taxes in question were not items directly applicable to performance of the work.

As to this claim the appellate court stated: "We find ourselves unable to subscribe to this contention. First, it must be pointed out that 'work' is defined in the contract as follows: 'The term "work" includes such labor, methods, material, equipment and transportation or other facilities as may be necessary to complete the contract.' Thus, the term "work" is by contractual definition a term broad in scope and meaning, connoting, we think, the entire performance of the construction contract. "Therefore, 'state taxes' * * * applicable to the work * * * quite clearly seem to have been intended by the parties to mean any state tax which was required to be borne in connection with or as a result of the performance of the entire contract."

(1) Herlihy Mid-Continent Co. v. Northern Indiana Public Service Co., 245 F. 2d 440, United States Court of Appeals, Seventh Circuit, June 21, 1957.

Right to Arbitration Lost by Starting Suit

Where a contract provides for the arbitration of disputes, the right to arbitrate is waived by the filing of an action to foreclose a lien. It cannot be regained simply by dropping the suit.

The rule was applied by a New York Court under the following circumstances.

An excavation contractor brought an action to foreclose a mechanic's lien.

While the action was pending, it made an application to the court for the appointment of an arbitrator to settle the dispute as called for by the contract. Opposition to the application was based on the ground that the contractor by bringing an action to foreclose the mechanic's lien had waived it right to arbitration.

(*Legal continued on page 80*)

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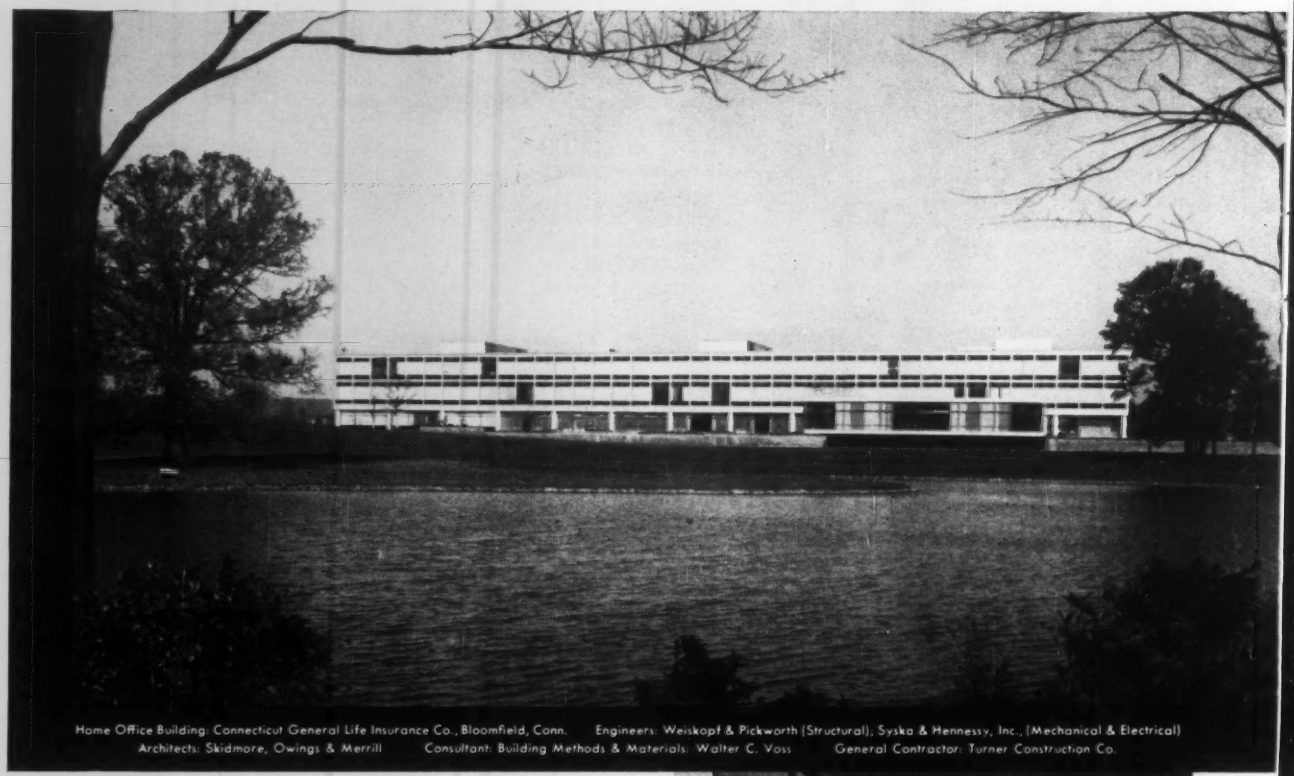

Home Office Building: Connecticut General Life Insurance Co., Bloomfield, Conn. Engineers: Weiskopf & Pickworth (Structural), Syska & Hennessy, Inc., (Mechanical & Electrical)
Architects: Skidmore, Owings & Merrill Consultant: Building Methods & Materials: Walter C. Voss General Contractor: Turner Construction Co.

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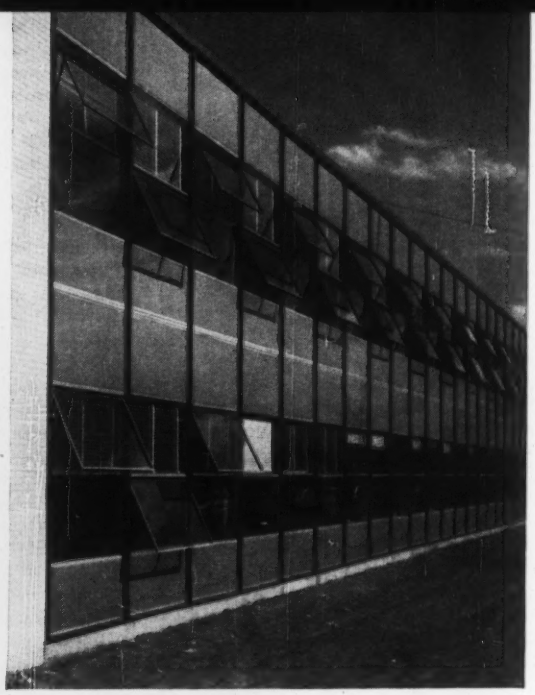


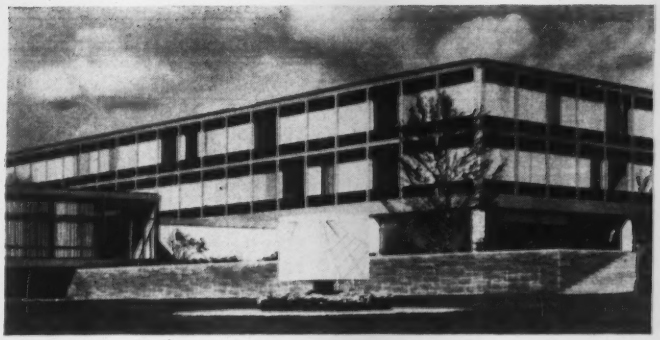
When the Connecticut General Life Insurance Company planned their ultra-modern office building in suburban Hartford, they carefully projected their needs into the future.

They wanted the nearest thing to "no maintenance" costs for 50 and preferably 75 years. Where initial investment in materials could cut down the yearly costs of cleaning, painting, and repairs they would make the investment.

That's why, throughout the building—both on the exterior and the interior—Republic's ENDURO Stainless Steel is used generously to protect, beautify, and reduce maintenance costs.

The main building—which contains some 400,000 square feet of floor space unbroken by a structural column—is penetrated by four garden courts, 72 feet square, making it possible for nearly all employees to be within 35 feet of a window. The cafeteria juts out from one end of the main building, cantilevered 15 feet over a pool. At the other end of the building, across a glass bridge, is a special department wing.

Once inside the metal and glass walls the stylish gleam of gracious architecture comes alive.



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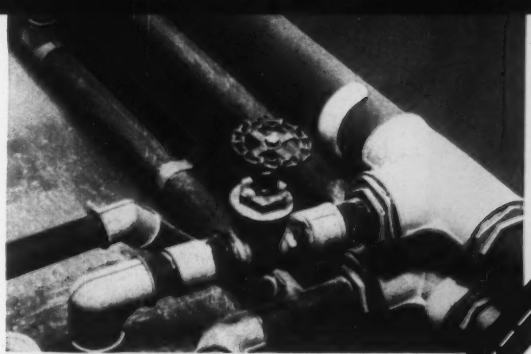

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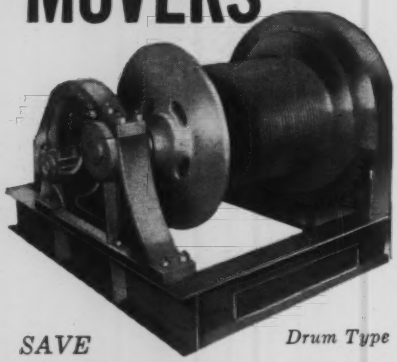

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While the disposition of the application was pending, the contractor discontinued the action and again made a demand that the dispute be submitted to arbitration. The party for whom the work was being done again opposed the appointment of an arbitrator, claiming that the contractor having instituted the action to foreclose the lien waived his right to arbitration, even though the original action had been discontinued. The court denied the application for the appointment of an arbitrator.[1]

The court, quoting from another case,[2] stated: "Moreover, it hardly seems to us that, even if respondents should at some time conclude to abandon proceedings under the Lien Law, it would avoid the intent indicated by filing the liens. The question is of the intent with which that act at that time was performed, and, if judged by the rules applicable to the question of intent, it indicated a purpose to abandon the right to arbitration. The right thus lost cannot be recaptured by a subsequent change of mind and conclusion by respondents that after all they would rather proceed under the arbitration clause than under the Mechanic's Lien Law. If the abandonment has been once made, it endures for the purposes of this proceeding, and its consequences cannot be avoided."

(1) Application of Acme Cassa, Inc., 162 N.Y.S. 2d 500, and numerous cases there cited, N. Y. Supreme Court, Kings County, April 5, 1957.

(2) Matter of Young v. Crescent Dev. Co., 240 N.Y. 244, 251, 148 N. E. 510.

Courts Use Certain Rules For Construing Contracts

A contract is supposed to reflect the intention of the parties it binds. In ambiguous cases, how do you determine what the parties intended?

Here are some general rules used by the courts:

"We believe it to be the universal rule of construction that where there is an inconsistency between the general provisions and specific provisions of a contract, that the specific provisions ordinarily qualify the meaning of the general provisions. Restatement of Law, Contracts, Section 236 (c). In State v. Commercial Casual Ins. Co, 125 Neb. 42, 248 N.W. 807, 810, 88 A.L.R. 790, in construing the terms of a contract the court said: 'It is a rule that, where there are general and special provisions in a contract, relating to the same thing, the special will control over the general provisions, and, if the contract is fulfilled according to the special provisions, the contractor has fully complied with the terms of his contract.' "[1]

Where handwritten and printed or typewritten matters in a contract are inconsistent, the handwritten part will prevail.[2] A contract will be construed most strongly against the party who prepared the contract.[3]

A contract must be construed so as to effectuate the intent of the parties when the contract was entered into. To ascertain such intent, the contract must be construed in the light of the circumstances existing at the time it was made.[4]

(1) Marshall v. Patsman, 306 P. 2d 287.
(2) Minchen v. Hirsch, 295 S.W. 2d 529.
(3) Ebenreiter v. Freeman, 79 N.W. 2d 649.
(4) Sobozak v. Kotwicki, 79 N.W. 2d 47.

Contractor May Waive His Right to Arbitrate

The right to arbitrate a dispute under a construction contract may be lost. Conduct of the contractor after a dispute arises may be considered a waiver of the right.

The owner of a housing project in New York, for example, sued the contractor for breach of contract. Although the contractor asked the court to dismiss the action because the contract called for arbitration, he simultaneously entered a defense to the action.

The court ruled that failure to demand arbitration when the suit was filed and the pleading of a defense amounted to a waiver of the right to arbitrate.[1]

(1) Clearview Gardens Corp. v. Little Bay Construction Corp., et al., 166 N.Y.S. 2d 841 Supreme Court, Appellate Division, Second Department, N.Y., Oct. 14, 1957, and cases there cited.

These summaries of court decisions are prepared by J. Vernon Werbin, Esq., New York attorney and licensed professional engineer, who is author of the following books published by McGraw-Hill Book Company, Inc.: *Legal Phases of Construction Contracts; Legal Guide for Contractors, Architects and Engineers;* and *Legal Cases for Contractors, Architects and Engineers.*

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". . . George Washington Bridge was a challenge."

" . . . must learn to communicate ideas"

". . . the rugged individualist is an egotist."

". . . an engineer must aim for beauty."

O. H. Ammann:

An Artist in Steel Design

Louis A. Volse
Assistant Editor

"Would you step aside so I can get a shot of the Governor and the rest of the dedication party?" asked the press photographer as he pushed onto the platform at the center of the bridge.

"Oh, I'm sorry," said an unobtrusive looking man as he moved out of the way.

And the photographer snapped his picture.

"By the way," he asked when finished, "which one of you designed the bridge?"

"It was I," came a voice from the side. And there, according to the story, stood Othmar Hermann Ammann who had stepped out of the way so that only *important* people would be seen in the news picture.

The year was 1931, when the George Washigton Bridge, spanning the Hudson River, was opened. This bridge, with a central span of 3,500 ft, established a new record for suspension bridge length at the time—nearly doubling the span of the previous record-holder. And it still holds the record for load capacity among suspension bridges.

As chief engineer for the Port of New York Authority at that time, O. H. Ammann also had—among other projects—directed the planning and building of the Outerbridge Crossing and the Goethals Bridge, the record-breaking arch bridge at Bayonne, N. J. Also, he was chief engineer of the Bronx-Whitestone Bridge and served on the board of engineers that planned the Golden Gate Bridge at San Francisco. During the decade between 1929 and 1939—when he retired from the PNYA to establish his own consulting firm—he was identified with the building of a majority of this country's largest spans of the era.

The story of the press photographer and the bridge designer is most probably true. A visit with the master designer certainly proves him to be still very much the unobtrusively modest man in the tale.

• **Mr. Ammann plays host**—O. H. Ammann, himself comes to his reception room to greet the visitor. He peers at his guest over horn-rimmed glasses; then come a smile and handshake; and the visitor is shepherded down the hallway to a medium-sized private office.

A bookcase—packed with engineering texts and references volumes—looms ominously behind Mr. Amman's walnut desk. Three huge pictures hang on the opposite wall: bridges, of course, and his favorites, the George Washington, the Bayonne Arch and the Golden Gate.

With the visitor seated before him, Mr. Ammann settles down at his desk. His chair has a swivel that carries him back in comfort. He opens his coat to relax.

The near-octogenarian (now 79) is a trim, surprisingly young looking man with nut-brown hair. Commenting on his lack of gray hair he says: "Even my wife tells me I should have more of it. She insists it would make me look more distinguished." He has blue eyes that know how to study both people and plans. And he moves fast. His fingers skim rapidly as he searches a desk drawer for some data. Or when he is in thought—recalling a long, full past for his visitor—his hand is swift and steady as he either fingers his glasses or taps his pencil on his desk top.

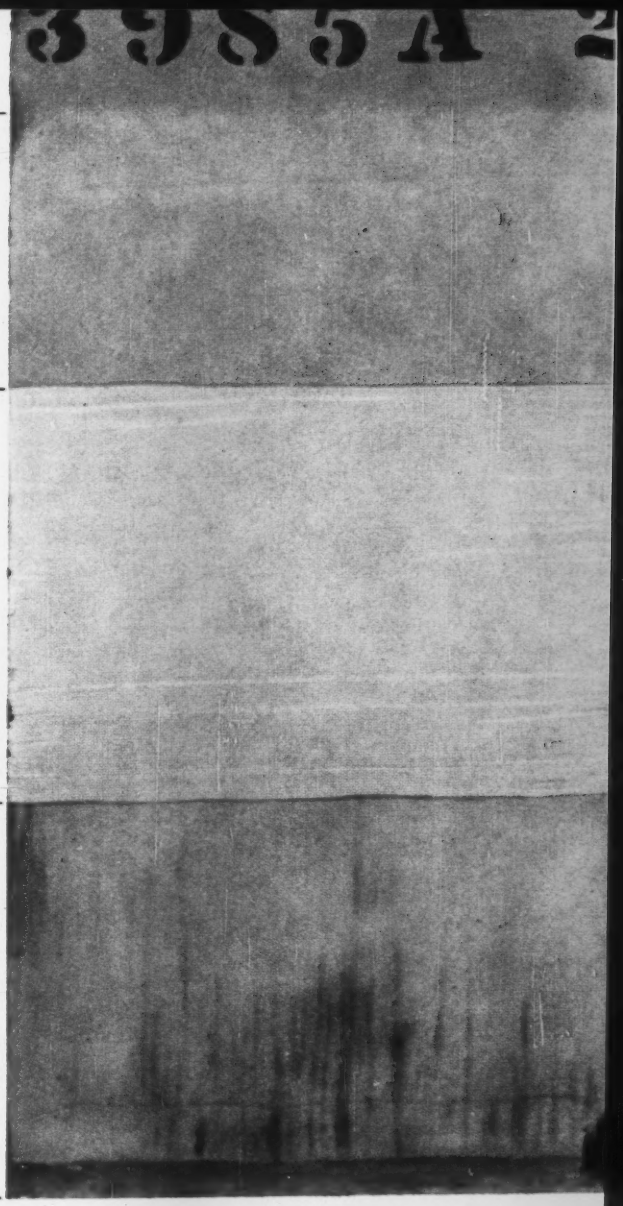
• **Talks of his schooling**—Othmar Ammann was born at Feuerthalen, a small town perched on the bank of the Rhine River in Switzerland. He studied in the public schools near Zurich. As a boy, he thought he wanted to be an

(*Men & Jobs continued on page 139*)

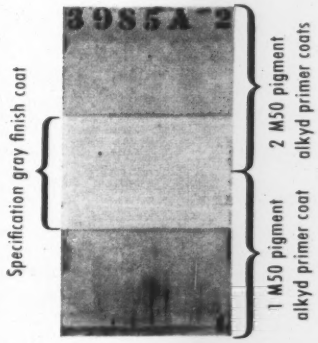
Area shaded from sun by wooden panel holder

After 9 years exposure, fading has barely begun to show in this 3-mil *M50* primer coat. Same type paint made with standard rust inhibiting pigment chalked and showed rusting in less than half this time.

Unshaded area



How test paints shown at right were applied



Exposed 9 years 45°S
Each coat 1.5 mils

1.5 mil M50 primer coat is still in place, still actively resisting corrosion after 9 years. Same type paint made with conventional pigment almost completely disappeared in the same period.

Proof M50 pigment Defense in Depth paints deliver lasting weather resistance

Never before such durable metal protection for highway bridges, guard posts, railings, sign posts. And never before such attractive color choices.

Here you see how typical M50 pigment primer coats weather 9 years exposure. The advantages of weather resistance like this in the primer coat of an anti-corrosive paint system cannot be overstressed. Long after weather has worked its way through intermediate and finish coats, primers made with *M50* basic lead silico chromate pigment* still provide excellent weather protection. Rust inhibiting action in the film continues unchecked. Even breaks in top coats traceable to damage or painting mishaps do little harm.

The excellent chalk resistance shown by *M50* pigment primers also pays off handsomely. When steel erection is delayed, repreparation of the steel is rarely needed. On-the-job spot priming is sharply reduced.

On the next page, see how typical *M50 finish* paints perform in severe exposure tests.

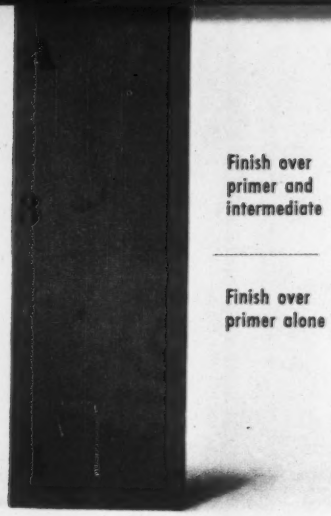
*Registered trademark of

National Lead Company

General Offices: 111 Broadway, New York 6, N.Y.

No visible splotching!

Test angles above show how a typical *M50* pigment finish paint applied directly to steel (no primer or intermediate) withstands 4 years exposure in industrial atmospheres. Left, *M50* pigment finish applied on rusted surface with retained mill scale. Right, same paint applied on clean, sand-blasted surface.



No visible chalking!

This test angle demonstrates the excellent resistance to chalking or fading shown by *M50* pigment Defense in Depth paints. Paint has been exposed 2 years, 45°S in normal atmosphere. The insolubility and stability of *M50* fused lead chromate pigment contributes substantially to this performance.

Here are two performance plusses you can expect from M50 anti-corrosive finish paints exposed to weather

With *M50** pigment Defense in Depth paints, *lasting* weather resistance is obtained in *all* coats . . . not just intermediates and finishes. This is clearly brought out by exposure tests such as the ones shown on this and the preceding page.

Along with lasting 3-deep weather resistance, *M50* pigment anti-corrosive paint systems give you 3-deep rust inhibition and 3-deep color choice. Never before has it been possible to produce specification anti-corrosive paints with comparable performances that could be sold at current market levels.

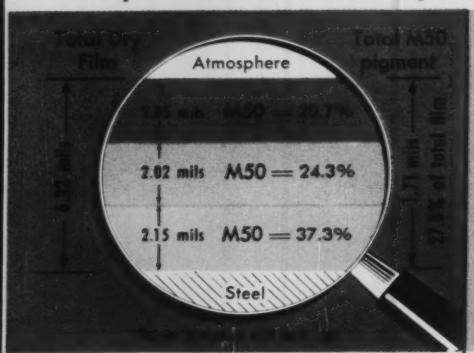
Now, with National Lead's *M50* pigment, most paint makers can make such paints.

National Lead is prepared to help your supplier formulate *M50* pigment paints and also: (1) show you *M50* pigment paint exposure test panels at its Sayville, L. I. Test Station; (2) send you a 24-page descriptive brochure, "Defense in Depth." (Mail coupon below); (3) provide technical aid in test applications; (4) help you develop suitable specifications for paints containing *M50* pigment.

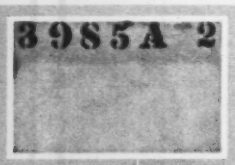
For M50 pigment paints themselves, contact your regular suppliers.

*National Lead Company trademark for a basic lead silico chromate pigment

Why M50 Defense in Depth paints give you metal protection beyond all former concepts



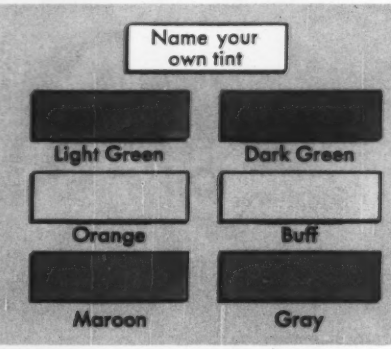
In every coat . . . rust inhibition! Fused lead chromate is noted for rust-inhibition. The *M50* pigment particle structure permits paint makers to include large proportions of lead chromate in all coats of anti-corrosive systems.



2 M50 pigment alkyd primer coats
Exposed 9 yrs 45°S
Each coat 1.5 mils dry film

M50 pigment finish put on rusty steel
Exposed 4 yrs 45°S in industrial atmosphere

In every coat . . . weather resistance! *M50* pigment is insoluble in water and has the excellent tint retention properties of fused lead chromate. Unlike other rust inhibitors, it actually boosts weather resistance of paints.



In every coat . . . your choice of colors! *M50* pigment gets along well with most tinting pigments, permits paint makers a wide range of colors . . . not only in intermediates and finishes but in primer coats as well. Colors stay true.

M50 Defense in Depth

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Gentlemen: Please send me your 24-page brochure, "Defense in Depth." Include color card of the six *M50* pigment paints you recommend for steel highway structures.

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architect, since he had found himself good at both math and art work.

"At the middle school level in Switzerland," Mr. Ammann explains, "a boy is taught his mathematics through the higher calculus. And he is given a broad background in philosophy and foreign languages—all good basic mental disciplines.

"After middle school, I attended the Kantonnschul—that's the lower technical school—in Zurich. By this time I had changed my mind and decided to be an engineer instead of an architect. Here I learned basic engineering fundamentals: statics, dynamics, mechanics and such. After three years of this, I went on to the final four year course in civil engineering at the Federal Institute of Technology. I graduated from there in 1902.

"After two years working in Germany at reinforced concrete design, I came over to this country, where I got my first job in New York City with Joseph Mayer, a consulting engineer.

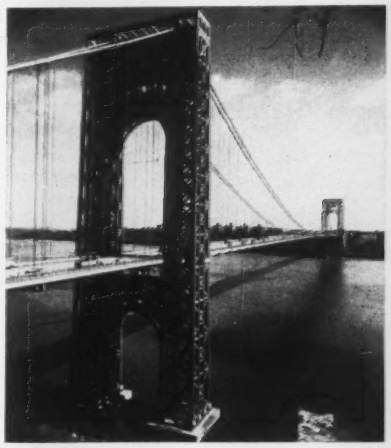
"I suppose it was then I had my first dream of spanning the Hudson River with a bridge. Mr. Mayer had been working on many railroad bridge designs at that time, and I did a lot of this work with him. He also had made up preliminary plans for a bridge to carry railroad traffic across the Hudson. Naturally, his ideas influenced me a lot when it came to planning the George Washington Bridge."

• **Expresses some convictions**—Mr. Ammann has strong convictions about how a bridge should be built and how it should look. He believes a bridge must satisfy its function with truthfulness—simplicity without ornamentation. He insists that the most beautiful forms are those that do their job simply.

However, he adds a note of caution to overly pragmatic engineers:

"Economics and utility are not the engineer's only concerns. He must temper his practicality with esthetic sensitivity. His structures should please the eye. In fact, an engineer designing a bridge is justified in making a more expensive design for beauty's sake alone. After all, many people will have to look at the bridge for the rest of their lives. Few of us appreciate eyesores, even if we should save a little money by building them."

• **Developed a large firm**—The phlegmatic bridge builder is not a lone wolf in his work. He is a believer in the conference table and in amalgamation of talents to do a job. This has been evident especially since 1946, when he formed a partnership with Charles S. Whitney, a Milwaukee consulting engineer. And carrying expansion further, the partnership has enlarged through the years (his son, Werner Ammann, is one of the partners), and there are also several associates in the firm.



GEORGE WASHINGTON BRIDGE, spanning Hudson is Ammann's favorite.

Mr. Ammann, with his associates, feels he has been able to render a broader variety of engineering services than he could have handled alone. Among the firm's major projects have been bridges, highways, auditoriums, coliseums, hangars, floating drydocks, blast-resistant buildings and military bases—built in the U. S., Europe, Asia and Africa.

O. H. Ammann insists engineering should be more than just a "business" for the consultant, since the public welfare is at stake in his work. For many years, before the expansion of his firm to the size it is today, he flatly refused to look for clients. He believes they should come to the engineer.

"Unfortunately," he adds, "when a consulting firm gets as big as we are it's impossible to keep from being a little aggressive. I really don't like to see this happening though."

• **Relaxes with music**—Mr. Ammann is not a great party-goer, especially if such socializing serves no particular purpose. He does attend engineering meetings and conventions, feeling that these are the type of gatherings from which he can benefit.

He enjoys opera, a symphony or a good play, and art in all its forms. He used to play the violin himself until "I found out I wasn't getting anywhere with it and gave it up."

The artist is also an athlete—Mr. Ammann enjoys sports. Even today he climbs mountains on his summer visits to Switzerland. Winter sports too, he used to enjoy—especially ice skating.

"But I don't ice skate any more. My bones are too brittle for it—if I should take a fall," says he.

• **Analyzes engineers**—In describing the "typical" (if there be such) engineer's personality, O. H. Ammann has this to say: "We may lack glamor and sparkle. We might even be considered dull by many people, but I don't believe it. I think that the fact that we are dealing so intensely with concepts outside the layman's ken makes us often not understood by them.

"This is actually the engineer's number one problem today. He must learn somehow to communicate more easily—both with his colleagues and with the public. Most of us [engineers], when we have something to say, will qualify our statement to death until we're bogged down and the point is lost to all but those who have the patience to dig to see what we really mean. Even then, one is not often sure.

"Perhaps one answer is to teach more language in the colleges. Teach the student engineer how to write reports, or how to explain something to somebody without stumbling all over the English language in doing it. Probably we could use more of the basic disciplines in American schools.

"Simplicity and directness are difficult attributes to attain anyway because it means taking a stand without having an out. In the first place the engineer who practices this must *know* what he is talking about. If he's sure of himself he can say a thing more directly."

In his consulting work, the bridge-builder is prodigiously attentive to office detail. He knows most of his many employees by both name and personality. And he understands them as people with both assets and failings.

He gives the same attention to plans and reports that leave his office. One of his partners says that nothing leaves the office that "O. H." has not scanned carefully. And because of this, if the firm is challenged on some design or report, Mr. Ammann himself personally shoulders the responsibility—often without the engineer at the lower echelon even knowing.

• **Dislikes attention**—While he is an even-tempered man, Mr. Ammann has one or two pet peeves.

One of them is to have anybody cater to him or show him deference because of his age or position. If, at a jobsite, anyone offers to help him up a ladder he pulls away abruptly.

"Leave me alone now. I can do it by myself," he might say. And he will crawl up the ladder rungs, hand over hand, onto his bridge.

Another way to ruffle his feathers is

O. H. AMMANN shows how caissons are sunk at the Thogs Neck Bridge.

to express admiration for the "rugged individualist" when he's within earshot. "A man like that is nothing but an egotist," he insists. "People are meant to work together. Nobody wants to see a one-man show."

• **Has a busy office**—Some bridge jobs being handled at present by the Ammann and Whitney firm are: Preparing preliminary plans with cost estimates for another Hudson River bridge near 125th St.; designing and supervising construction of a bridge across the East River at Throgs Neck; consulting on the design of a second deck to the George Washington Bridge; and designing a bridge across the Narrows between Brooklyn and Staten Island. This bridge, planned with a central span of 4,260 ft to carry 12 traffic lanes on two decks, will be the longest and mightiest suspension span in the world.

• **Enjoys life**—O. H. Ammann finds life a lot of fun. He enjoys his work; he claims that if there is any secret for longevity and good health, it is in a man's love for his work.

"Often, in years past, I would enjoy staying up till 2 a.m. working on a particularly interesting problem. Or I might get up at four in the morning to get at something that was on my mind. "But these were in my younger days," he adds wistfully. "Now I sit back and let the others do most of the work. I mostly just look over and review what they've done."

Other results of his labors, in addition to tangible evidence left the world in the form of steel bridges are: six honorary degrees from universities in the U.S. and abroad, at least three awards and prizes for outstanding engineering achievement, professional registration in six states, membership in a dozen engineering societies, institutes, clubs and fraternities (honorary member of ASCE) and fellowship in the American Association for the Advancement of Science.

Whenever the conversation comes around to bridges, Mr. Ammann beams.

"My favorite bridge?" he muses. I suppose it is the George Washington Bridge. That was my real 'first.' It was a big job that presented a great challenge to me. Yes, that, along with the Bayonne Arch Bridge, which I have always thought was rather a pleasant looking arch structure."

The visitor asks the designer how long he thinks his bridges will stand. He hesitates a moment and bows his head while he drums the desk top before replying:

"Well, you never know what men or civilizations will do with themselves. But, barring catastrophes—that none of us like to foresee. . . ."

Then he looks up and smiles when he adds:

"How Long? Why forever, of course."

Careers

Public Works

Robert H. Willet has been appointed assistant division engineer of the 150 mile Buffalo division of the New York State Thruway.

Gerald D. Moore has been appointed assistant chief of operations, Corps of Engineers, North Atlantic Division. He will direct military and civil works construction in the Middle Atlantic states.

Lloyd C. Huffman, former waterworks chief for Dayton, Ohio, has been appointed to head the sanitary engineering department of Montgomery County, Ohio.

Col. Arthur M. Jacoby, assistant division engineer of the Army Corps of Engineers' South Atlantic Division, will become district engineer at Little Rock, Ark., succeeding Col. Staunton L. Brown, who will retire March 31.

Harry H. Kirchman has resigned from his position as city engineer of Virginia, Minn., to become the director of public works for Fridley, Minn.

Col. Herbert Milwit is appointed deputy division engineer of the North Central Army Engineer Division, Chicago. He is a graduate of the U. S. Military Academy.

Business

Paul L. Nichols has opened consulting engineering offices in Santa Rosa, Calif., and Kailua, Hawaii, under the name of Paul L. Nichols & Associates, for the practice of water supply and waste water disposal, pipelines and pumping plants, highways and related structures, and military installations. Mr. Nichols was formerly chief engineer of the Sonoma County Flood Control and Water Conservation District in Santa Rosa.

Ronald E. Greene, assistant manager of construction for Detroit Edison Co., has retired after 32 years with the firm.

Thomas P. Hutchinson has been appointed representative of Infilco (Canada) Ltd. in Eastern Ontario, Quebec and the Maritime Provinces with headquarters in Montreal.

J. Dean Worthington has been appointed chief civil engineer of Pacific Gas and Electric Co., San Francisco, to succeed Carl W. Appleford, who has retired after 38 years of service with the company.

Avery C. Wallen has been elected vice president of the Southern Engineering Co. at Charlotte, N. C., and will continue as general sales manager. He has been associated with the steel fabricating firm since 1945 as an engineer and as a sales department executive.

Tadius J. Gutt has been named vice president and general manager of George Rackle and Sons Co., Cleveland structural concrete manufacturer. He joined the firm as assistant to the president in 1956, after having been with the Texas Stressed Concrete Corp. in Austin.

E. J. Tiefenthaler of Worden-Allen Co., Milwaukee, is retiring as president and member of the board after 53 years of service in the structural steel fabricating industry.

Eric Steinmann has resigned as general plant manager of the Aetna Steel Products Corp., Pottsville, Pa., to return to the consulting field.

J. C. Arntzen and **G. W. Schlutius** have been elected executive vice presidents of the Mississippi Valley Structural Steel Co., Chicago. Other personnel changes include the appointment of **R. A. Simonsen,** plant manager and **F. P. Haas,** contracting manager, at the Melrose Park, Ill., plant; and **A. O. Muehlenbrock,** plant manager, and **R. M. Boydstun,** contracting manager, at the company's St. Louis plant.

LEFT: A typical section of pavement to be treated with Bitumuls Slurry Seal in Rochester.
RIGHT: The same pavement section after treatment with Bitumuls Slurry Seal. (Note how the crack in the foreground has been sealed).

BITUMULS SLURRY SEALS ARE REAL LIFE SAVERS*

For Pavements in Rochester, New York

*By permission of Beech-Nut Life Savers, Inc., for candies

The City of Rochester, New York, was faced with a problem common to many communities today: keep all streets maintained in serviceable condition; yet do it at a cost that will permit the complete replacement (out of Maintenance Department funds) of many miles of streets that are over-aged.

Problem: How can you keep overall maintenance costs low enough to permit planned replacement of certain streets?

Answer: Bitumuls Slurry Sealing . . . a "life saving" technique for keeping distressed pavements in "good working order". Streets that were badly oxidized, cracked and open-textured due to a combination of age, heavy traffic, and winter weather were readily rejuvenated by the sealing, crack-filling and void-filling properties of Bitumuls® emulsified asphalt slurry.

Bitumuls Slurry Seals actually provided a holding action against wear and weather at extremely low cost. Savings over former methods were pronounced because very-costly winter patching of chuck-holes was completely eliminated. As a result, expenditures for repair and control of winter damage were **reduced by almost seventy percent!**

The money thus saved was diverted to reconstruction of streets that were beyond maintenance or repair.

Bitumuls Slurry Sealing is normally . . . and should be . . . regarded as only a **temporary treatment** for distressed pavements. Adequate repairs or pavement-replacement must eventually be made. Yet it is truly a "Life Saver", since it seals, protects and preserves any basically sound pavement against further deterioration until such a time as major repairs can be made, or the pavement can be replaced.

Typical view of the high-speed, high-efficiency Bitumuls Slurry Sealing in Rochester.

Your community, too, can benefit from the use of Bitumuls Slurry Seals. For further information on Slurry Sealing . . . or for the complete Bitumuls/Life Saver story . . . call our nearest office.

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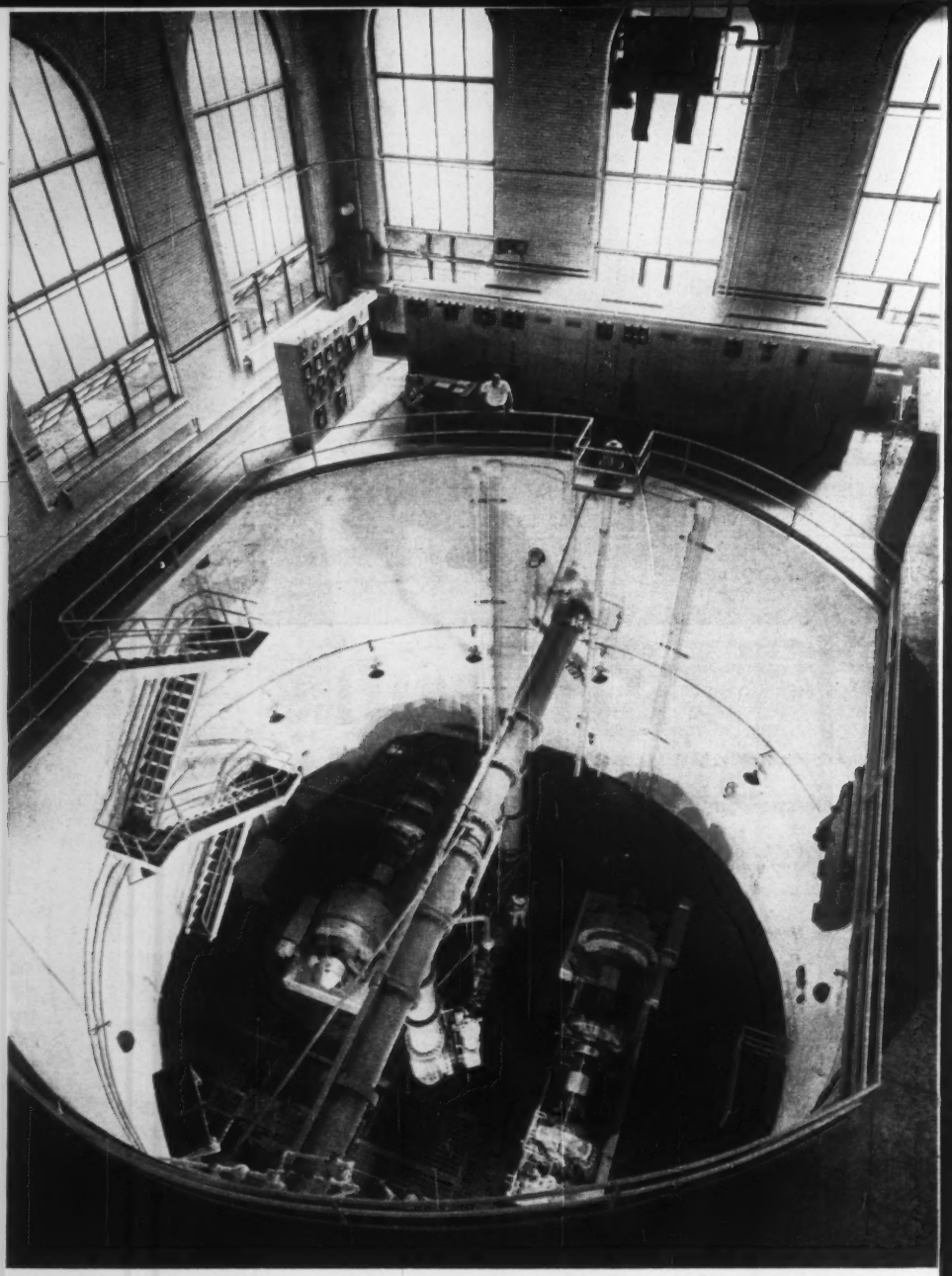
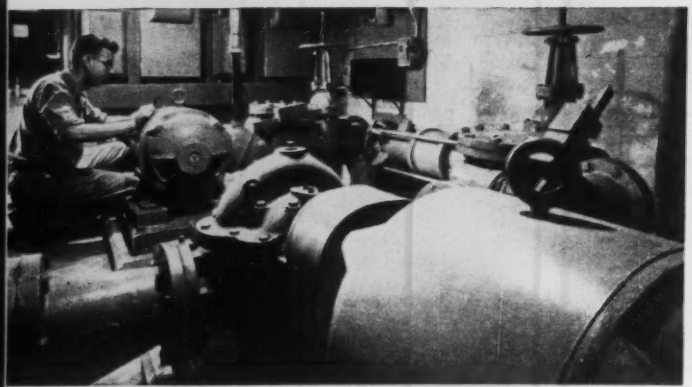
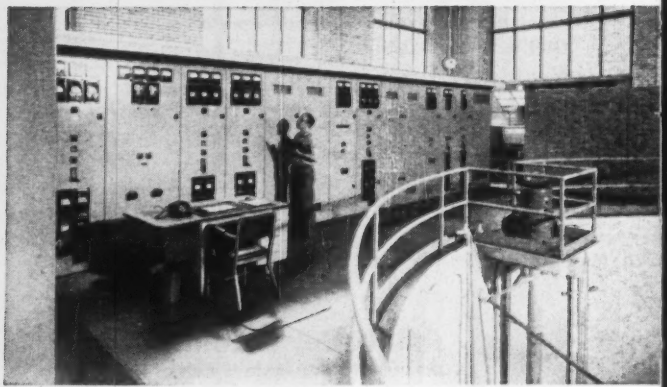


View at Nadine Pumping Station shows south pump pit containing pumps No. 2 and No. 3 with Westinghouse metal-clad switchgear and control center for all station pump motors in background.



Close-up view in booster station shows two 40-hp Westinghouse motor-driven booster pumps, Westinghouse safety switches, motor starters and power factor correction capacitor.



Metal-clad switchgear includes: incoming line section; starting breakers for 1000- and 1250-hp synchronous motors and their auxiliary field control cubicles; starting and running breakers and reactors for two 2500-hp motors.

Water pumping station saves $66,500 annually by Powering-Up electrically

The need for extensive modernization and expansion of water pumping facilities at Nadine Pumping Station of The Wilkinsburg-Penn Joint Water Authority brought about a complete change from steam to electric motor-driven pumps. One new 6.5-mgd pump was added to the three already in use to increase total capacity to 52,000,000 gallons per day.

In addition to the benefits of increased capacity and complete station electrification, comparative figures show a reduction in annual operating costs from approximately $268,000 to $201,500, for a savings of $66,500 per year. This represents an annual return of about 19% on the modernization cost of approximately $350,000. This fast five-year amortization of the investment eliminated the necessity of bond issues or other financing.

Besides the four new pump motors supplied by Westinghouse, the station now contains a line-up of 5-kv metal-clad switchgear, a 150-kva dry-type power center transformer, a motor control center for auxiliary power and a station battery and automatic battery charger.

The electrical Powering-Up of this pumping station has also made possible a more flexible discharge piping arrangement and the electric operation of valves and other equipment.

Powering-Up electrically can mean similar important benefits and savings for you. For further information, call the Westinghouse electrical construction engineer nearest you. He can help you in your Power-Up program. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

Owner: The Wilkinsburg-Penn Joint Water Authority
Consulting Engineers: Morris Knowles, Incorporated
General Contractors: Dravo Corporation
Electrical Contractor: Morganstern Electric Co., Incorporated

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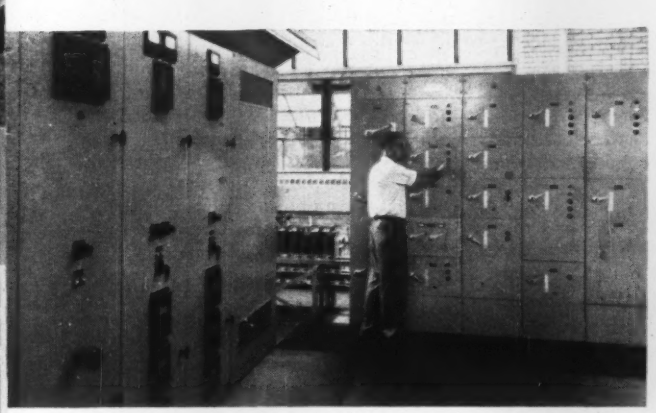

Shown at left is metal-clad switchgear feeder cubicle and 150-kva dry-type transformer. Motor control center at right contains motor starters and feeder breakers for various station auxiliaries.

Engineering group shown includes: George A. Maibach, Chief Engineer, Nadine Pumping Station; G. V. Gustafson, Morris Knowles, Inc., Consulting Engineers; M. B. Trimble, Westinghouse Construction Sales Engineer.

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Obituaries

Maj. Gen. Clarence L. Sturdevant, 72, the Corps of Engineer man who was in charge of construction on the Alcan Highway, died recently. A graduate of the U. S. Military Academy, he started as a second lieutenant in the Corps in 1908 and during his long career served as Assistant Chief of the Corps; Chief of the Troops Division, Office of the Chief of Engineers; Commanding General, Intermediate Section, Services of Supply, Australia; and Deputy Chief of Staff for Administration, Headquarters, Air Forces, Western Pacific. Among earlier posts were those of Seattle District Engineer and district engineer in the Missouri River Basin.

Charles W. Kinnison, 80, treasurer of The Austin Co., engineering and construction firm, died March 31 in Cleveland. With the company since 1912, he spent a good part of his time coordinating the firm's employee safety program and insurance activities.

William G. B. Euler, 74, retired former executive vice president and director of Pacific Gas & Electric Co., died March 9 at Atherton, Calif. An electrical engineer, he was in charge of PG&E's expansion program from 1947-1953. This involved construction of such installations as the West's three largest steam-electric generating plants and the 500 mile Super Inch gas transmission line.

John H. Burwell, 68, engineer in charge of the Schenectady Water Department from 1936 to 1951, died March 19, in Schenectady. He graduated from Union College with a degree in civil engineering in the class of 1914. He joined the city water department in 1915, became assistant engineer in 1919 and was appointed to head the department in 1936.

James E. Dougherty, a retired civil engineer, builder and real estate appraiser of New York City, died February 22. He was president of Dougherty Brothers, Inc., a real estate management and ownership concern. He graduated from Manhattan College in 1905.

Claude H. Wall, 67, an associate professor of civil engineering at Ohio State University, died March 4 in Columbus. He had been associated with the university since his graduation there in 1920.

J. Sterling Kinney, 49, professor and head of structural engineering at Rensselaer Polytechnic Institute, died January 30. Professor Kinney received his doctorate from RPI in 1937 and had continuous service with RPI since 1940. From 1937 to 1940 he worked as a design and estimating engineer for American Bridge Co.

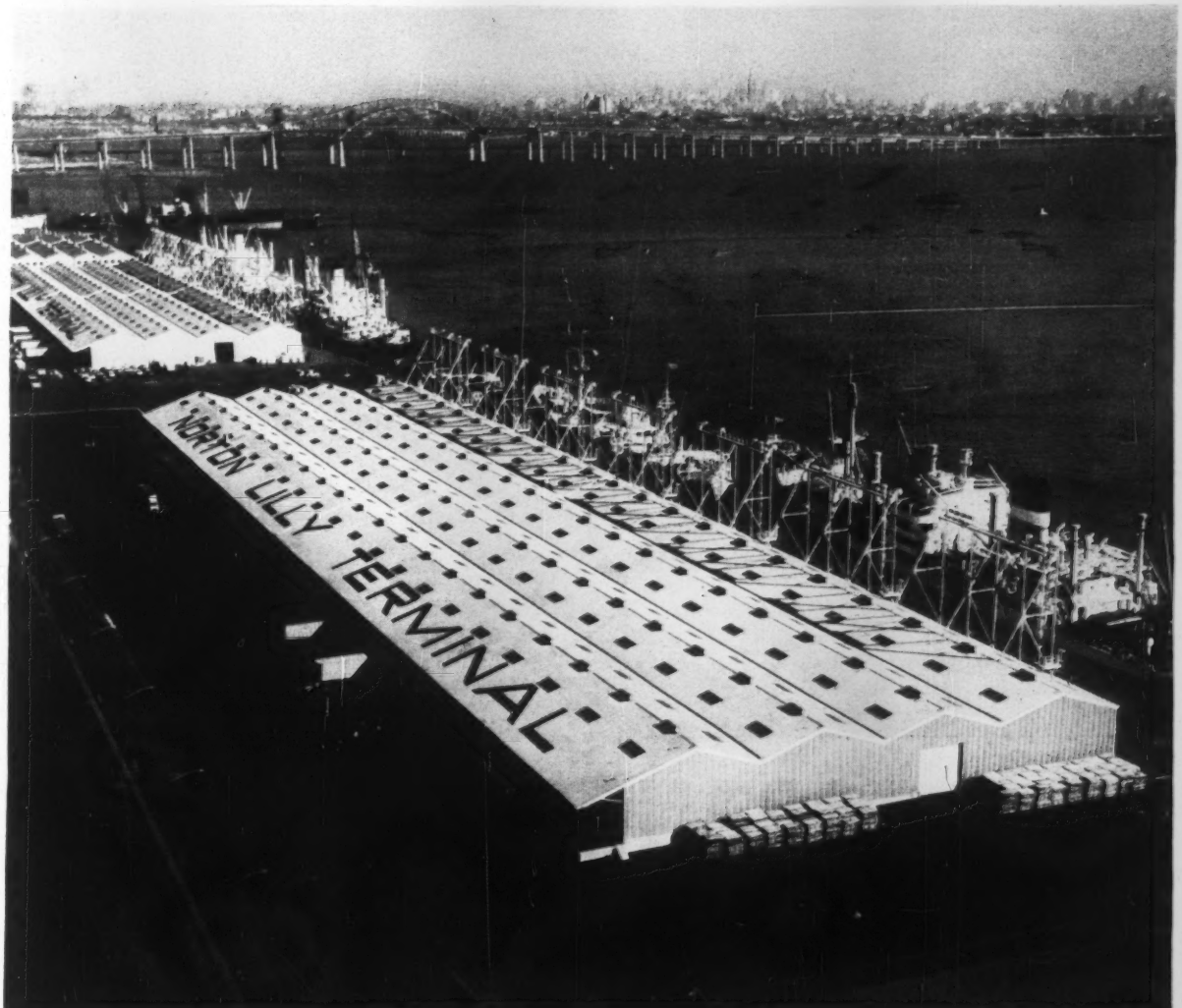
George E. J. Pistor, 78, of Upper Montclair, N. J., retired contracting engineer for Bethlehem Steel Co. and one of the founders and first treasurer of the American Institute of Steel Construction, died March 23. A 1901 graduate in civil engineering from Cornell University, Mr. Pistor immediately went into the structural steel fabricating business with the Hay Foundry and Iron Works in Newark, N. J. This firm was absorbed by McClintic Marshall Co., which, in turn, was taken over by Bethlehem, from which Mr. Pistor retired in 1946.

Claude H. Wall, 67, professor of civil engineering at Ohio State University, died March 4. He had been employed at OSU since his graduation there in 1920.

Ovid Wallace Eshbach, 64, dean of the technological institute, Northwestern University, for nearly 20 years, died March 4. He graduated from Lehigh University in 1915, and following graduation he taught at Lehigh for a total of six years. He was assistant engineer for the Bell Telephone Co., for two years and also served on the faculties of the Brooklyn Polytechnic Institute and Massachusetts Institute of Technology. In 1939 he became Northwestern's first dean, and at the time of his death he was professor of engineering sciences.

Carl S. Hamilton, 60, supervising bridge engineer in charge of maintenance on California stated-owned toll bridges, died recently in Oakland. After studying at the University of British Columbia, he began his career on San Francisco Bay Area projects, including the Posey Tube. After two years with the Bureau of Public Roads, Mr. Hamilton started his 28 year service with the California Bridge Department as resident engineer on bridge and subway construction. He was recognized as a leading expert on paints and protective coatings.

Charles A. Quick, 61, assistant civil engineer with the New York State Department of Public Works at the Syracuse office, died February 17 in Albany, N. Y. He joined the Syracuse staff in 1931.



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Because of aluminum's natural resistance to salt atmospheres and humidity, the Port Authority is going forward with a huge building program of aluminum-clad structures. On both sides, New York and New Jersey, similar buildings, specially designed by the Port Authority, are planned—*all* of aluminum, *all* with the same economic and anticorrosion advantages as these two. Aluminum also results in lower framing and erection costs, and its high reflectivity keeps heat outside, improves lighting inside. Certainly these many initial and long-term gains make investigation worthwhile for you.

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TUFCOR sheets enable you to space purlins farther apart, help you save on structural framing costs. Longer sheets speed building erection and lower field costs. Tufcor deck with insulating concrete offers a better roof system to designers, builders and owners. Here's why:

GREATER STRENGTH—Fabricated from 80,000-psi steel, new Tufcor supports greater loads, takes construction abuse. Galvanized Tufcor chemically bonds with insulating concrete to form a structural composite deck assembly, has a safety factor of 5 to 10 times live load.

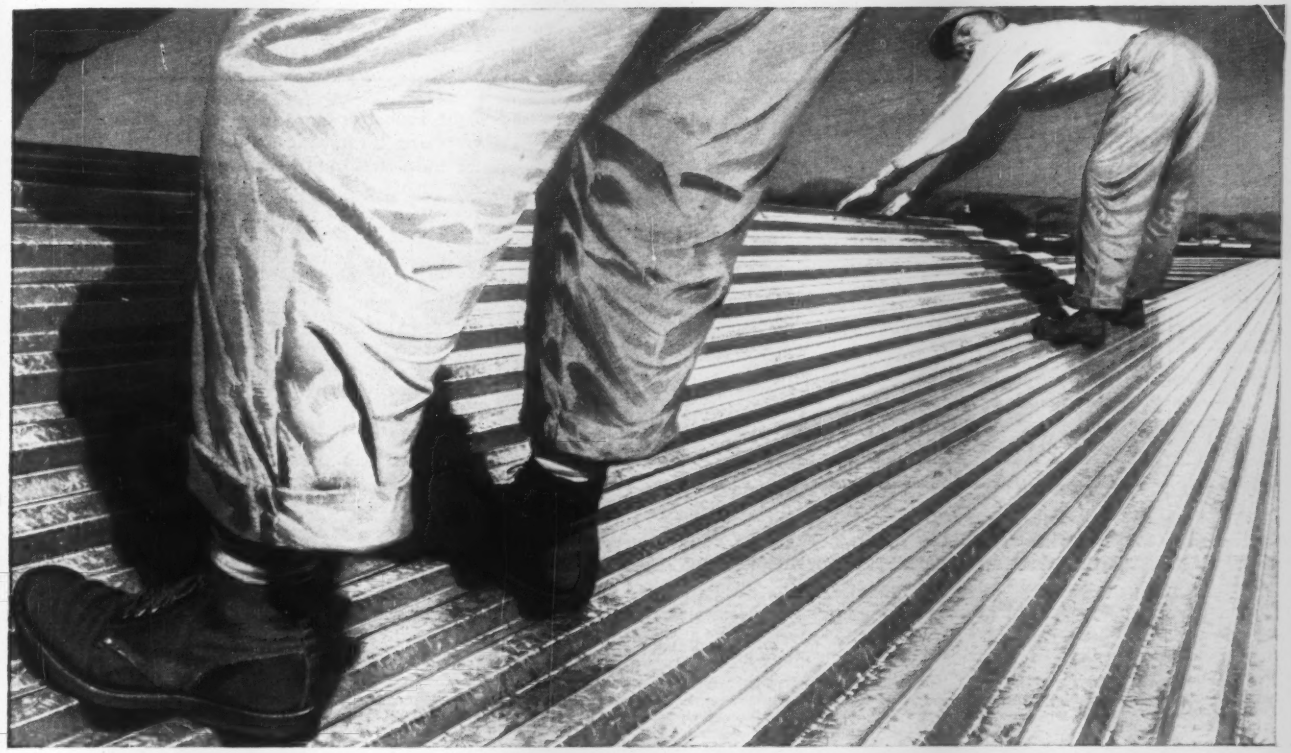
Tufcor roofs are so strong they are approved by the International Conference of Building Officials as diaphragms to resist *earthquake* forces.

LIGHTWEIGHT—Tufcor plus insulating concrete weighs about 7 psf, which is *4 to 6 psf less than many deck systems!* Incorporating the dead load of a Tufcor system in your building design offers savings in cost of framing.

EFFECTIVE INSULATION—Insulating concrete provides excellent resistance to heat. To obtain desired "U" factor, you merely vary the thickness of concrete fill. Slopes for drainage are easily provided. Tufcor's vapor barrier action keeps moisture out of fill, keeps insulation effective.

FIRE-RESISTANT—Exposed deck has UL fire resistance rating. Neither Tufcor nor insulating concrete supports combustion. System saves on insurance rates and on cost of sprinkler system.

AVAILABLE COAST TO COAST—Investigate Tufcor *now!* For more facts, consult your Granco district office or mail coupon.



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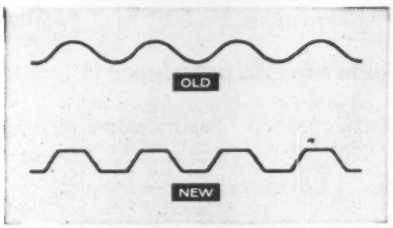
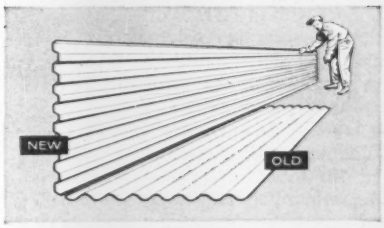


STRONGER CORRUGATION—New angular Tufcor pattern increases sheet strength 25%, and, with longer length, ups effective span range from 7′ to 10′.



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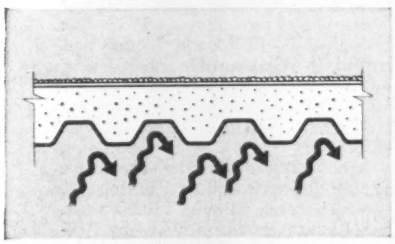

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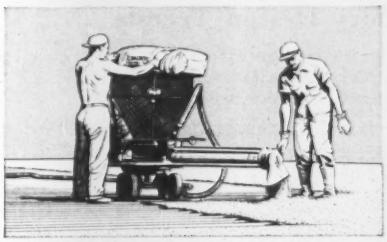

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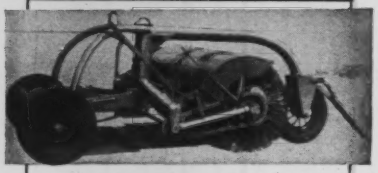

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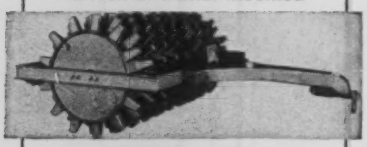

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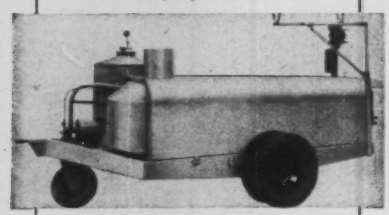

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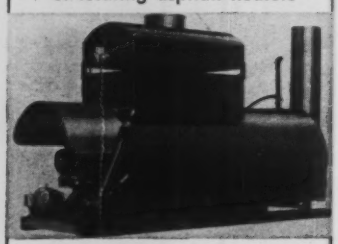

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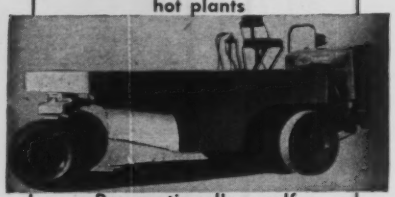

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Books

Textbooks Surveying

ENGINEERING SURVEYS: Elementary, 3rd ed., by Rubey, Lommel & Todd, 480 pp. including appendix and tables, the Macmillan Co., 60 5th Ave., New York, $5.00.

ENGINEERING SURVEYS: Elementary & Applied, 2nd ed., by Rubey, Lommel & Todd, 916 pp. including appendix and tables, the Macmillan Co., 60 5th Ave., New York, $6.75.

In the enlarged editions, the authors are aiming to combine the value of a traditional engineering surveys text with the practicality of a more modern approach. While the text material in these new editions has been reviewed and modified, general treatment remains the same as previous editions.

A 19 page appendix describing some modern surveying instruments and discussing measurement and error theory is included in both. Useful surveying tables and practice field notes complete the volumes to make them a practical working text.

Preventing Landslides

LANDSLIDES AND ENGINEERING PRACTICE—HRB Special Report 29, edited by Edwin B. Eckel, 232 pp. Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $6.00.

This publication—the result of several years study by the HRB's Committee on Landslide Investigations—may well become a standard reference work for those concerned with this work. The volume compiles information useful to the engineer who must recognize, avoid, control, design for or correct landslide movements. Theoretical discussions are kept to a minimum to emphasize the practical applications of theory.

The book is divided into two parts: Part I defines the problem and gives the engineer the tools to solve the problem. Part II summarizes the ways of preventing and controlling landslides and discusses ways of making stability analysis to be used in solving design problems.

Factory Design Trends

BUILDINGS FOR INDUSTRY—By the editors of ARCHITECTURAL RECORD. 309 pp. F. W. Dodge Corp., New York City. $9.75.

Trends in design of industrial buildings are clearly portrayed in this book, which is profoundly illustrated. The contents consist principally of articles that were published in recent issues of ARCHITECTURAL RECORD.

The book is divided into six sections, covering design principles, warehousing, light industry, consumer goods, manufacturing laboratories, utilities and service industries, and heavy industry. The last portion describes 74 specific buildings in detail.

Emphasis in the treatment of buildings in this volume is heavily on appearance and layout. Heating, air conditioning and lighting are discussed, but structural framing is not given much attention, and construction methods are almost completely ignored.

Structures in Motion

ADVANCED DYNAMICS—By John E. Younger. 285 pp. The Ronald Press Co., New York, N.Y. $8.50.

Because of current interest in behavior of structures subject to earthquakes, vibrations or blast forces, this book should be useful to engineers, though it has been prepared principally for students who have completed junior-level courses in statics, dynamics, strength of materials, integral calculus and differential equations.

As the author points out in the preface, the basic principles of dynamic analysis are few and simple. Their application to specific problems frequently is difficult. The objective of this book is to develop proficiency in solving problems. It presents many examples covering dynamics of rectilinear, angular, plane and three-dimensional motion.

Of particular interest to civil engineers is a chapter on dynamics of beams. Examples show how to solve problems in vibration of cantilevers, tie rods and beam-columns.

Reports and Pamphlets

COLORADO-BIG THOMPSON PROJECT—Volume III. 158 pp. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. $2.25.

ELECTRICAL CONSTRUCTION COST MANUEL—by Ralph Edgar Johnson. 448 pp. McGraw-Hill Book Company, 330 W. 42nd St., New York 36. $10.00.

URBAN MOTORWAYS—245 pp. British Road Federation, Ltd., 26 Manchester Square, London W1, England.

THE NATIONAL FIRE CODES, 1957—Six volumes: Vol I—Flammable Liquids and Gases; Vol. II—Combustible Solids, Dusts, Chemicals and Explosives; Vol. III—Building Construction and Equipment; Vol. IV—Extinguishing Equipment; Vol. V—Electrical; Vol. VI—Transportation and Misc. National Fire Protection Assoc., 60 Batterymarch St., Boston 10, Mass. $6.00 each volume; $30.00 a set.

NUCLEAR ENERGY IN THE SOUTH—by Redding S. Sugg, Jr. 151 pp. Louisiana State University Press, Baton Rouge 3, La. $3.50.

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Here is the newest model of the world's most advanced Bituminous Paver. It is designed to bring contractors all over America bigger profits through improved, more automatic operation.

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New one-piece screed of abrasion-resistant alloy steel provides smoother finishing. Brand new screed extensions install faster. Big cam-type adjustment bolts eliminate shimming, give you a true line surface up to sixteen feet. Two screed heaters are standard on the Express Paver for faster heat-up, more even heat distribution. Positive and negative crowns adjustments are made from a turn buckle-type adjustment nut above the screed. Planing adjustment point is located *at the screed.*

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New Augers on the Express Paver are tapered toward center for better distribution of the mix. Auger faces are abrasion-resistant for longer wear. New hangers support the augers and are equipped with sealed anti-friction bearings.

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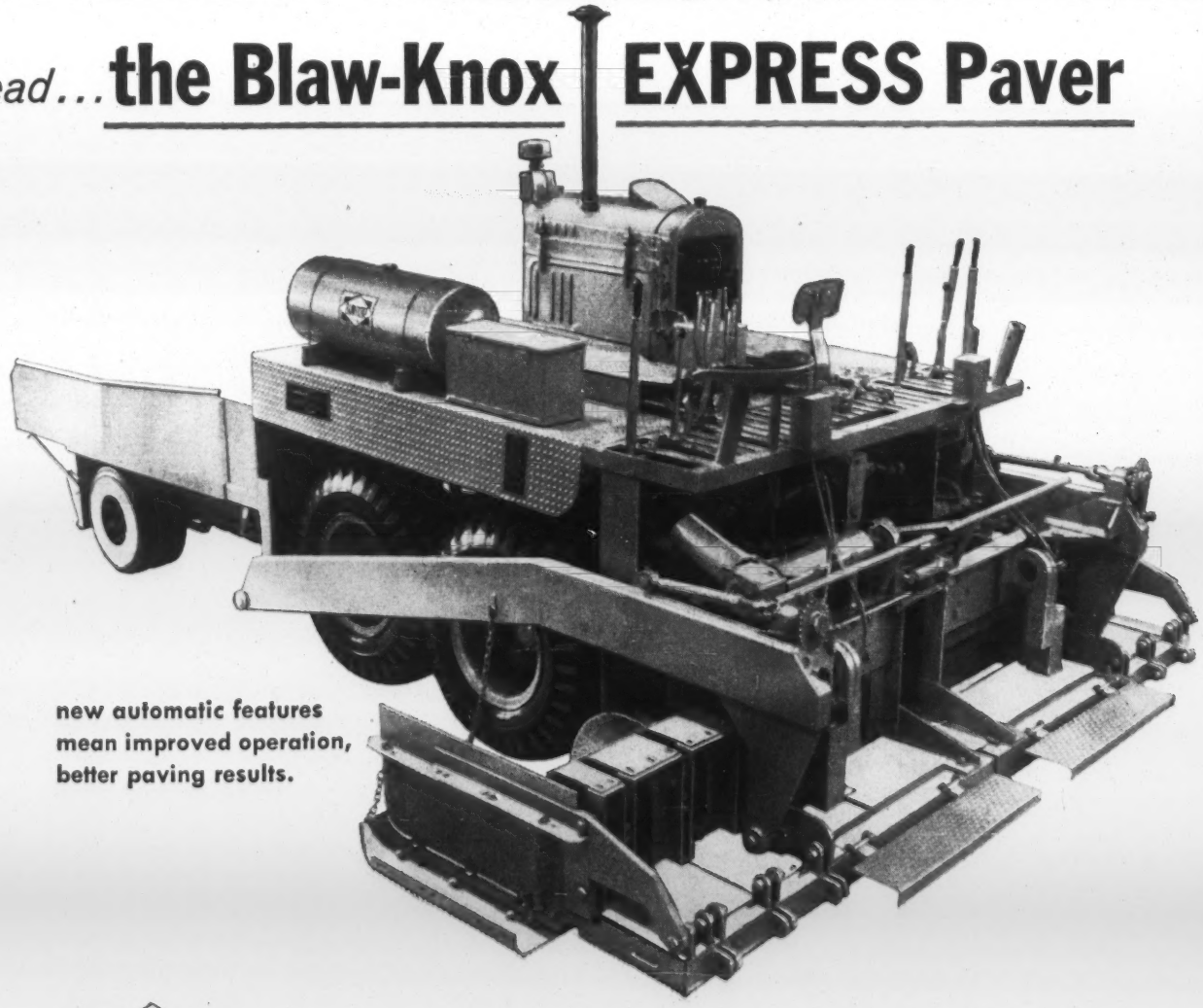
For a small additional investment you can specify the new air control package for more automatic operation of material feed, traction clutch and brakes. Material feed control automatically shuts off conveyor and augers when proper level of mix is reached.

The new traction air clutch provides smoother starting, no clutch adjustment and hydraulic braking is easier with air actuation. Air system is operated from a convenient finger-tip panel which is quickly moved to either side of the machine.

Get full season benefits from this new, improved, machine. Your Blaw-Knox distributor has all the information. Call him today!



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Baltimore Rebuilds Bridges

$1,051,000 contract includes also removal of old walls and bridges, grading and drainage

This work on the Jones Falls Expressway in Baltimore, Md., covers 750 ft of preliminary grading and drainage, reconstruction of two bridges over a valley and the Pennsylvania Railroad tracks, and construction of retaining walls.

The Baltimore Bureau of Highways award to Case Construction Corp., Mt. Airy, Md., at $1,050,704 is 12% under the engineer's estimate. Rummel, Klepper & Kahl, Baltimore, are the consultants.

Portions of the existing bridge over Biddle St., including part of the superstructure, the west abutment and pier, will be removed. The reconstructed portion of the bridge will be 102.17 ft long, 66 ft wide and 23 ft high, consisting of a steel and reinforced concrete single span supported by reinforced concrete abutment and pier.

The existing bridge over Preston St. will be completely removed and replaced by a 143.17 ft long, 66 ft wide, 28 ft high bridge, consisting of two unequal spans of steel and reinforced concrete, supported by reinforced concrete abutments and intermediate pier.

The reinforced concrete decks of both bridges will be supported by longitudinal plate girders or WF beams, depending on span lengths, and will have 40 ft roadways flanked by 12 ft sidewalks with parapet. Aluminum barricades, mounted on each parapet, will extend continuously over the portion of the bridge directly over the Expressway, and aluminum pipe railings similarly mounted, will extend over the remaining portions.

All structures will be on spread footings, except the west abutment of the reconstructed bridge and portions of retaining walls, which will be on steel end bearing piles.

Preliminary grading and drainage includes work necessary for relocation of some Pennsylvania Railroad tracks, but does not include removal or relocation of the tracks or turntable.

Also included are a portion of the existing expressway viaduct structure; removal of existing masonry retaining walls on both sides of the valley and construction of reinforced concrete retaining walls of various heights and sizes on both sides of the regraded valley. The contractor must maintain traffic.

The city, however, will do the following, or let under separate contracts: demolish three residences; remove light standards, traffic signals, police call boxes, electrical conduits, wiring and electrical fixtures for the bridges and approaches, water lines, valves and meters, overhead trolley system, telephone cables, gas mains and sign boards, electrical work and bituminous roadway wearing surfaces on the new and reconstructed bridges and approaches.

Class A concrete requires 6.5 bags of cement, plus additive, compressive strength 3,600 psi in 10 days. Cast iron pipe is Class 150, AWWA C102-53, C106-53 and 108-53.

Minimum wages on the project include: carpenters, 2.85; cement masons, $3.05; reinforcing ironworkers, $3.50; painters, structural steel and bridges, $3.25; concrete spreading machine operators, $2.35; welders, $3.65; unskilled laborers, $1.45.

Railroad protective services include: B&B inspector, $405.22 a month; track foreman, $398.96 a month, and track watchman, $1.822 an hour.

1C	Case Construction Corp., Mt. Airy, Md.	$1,050,704
2	Allied Contractors, Inc., Baltimore	1,089,966
6	The Whiting-Turner Contr. Co., Baltimore	1,230,459
EE	Rummel, Klepper & Kahl, Baltimore	1,194,000

Bids: 3-26-58

Items	Unit	Quantity	Unit Prices 1C	2
Excavation, roadway	cy	55,500	$3.55	$2.80
structure	cy	5,200	6.00	13.00
Backfill, porous	cy	460	9.00	8.00
Borrow, excavation	cy	7,200	3.20	2.00
Masonry, remove existing	cy	6,520	10.00	8.00
Piles, steel H	lf	4,800	8.00	7.50
test	lf	100	10.00	10.00
load tests	ea	2	500.00	1,000
Conc, cl A, abut, piers & walls	cy	4,200	62.00	62.00
bridge deck	ls	job	55,000	66,300
sub foundation	cy	150	18.00	40.00
Steel reinforcing	lb	630,000	0.16	0.13
Dampproofing	ls	job	2,900	6,300
Cement for gunite	bag	700	10.00	11.00
Steel, structural	ls	job	196,000	214,000
Aluminum barricades	ls	job	13,000	16,000
pipe railing	ls	job	5,000	7,500
RCP, culv, 15"	lf	380	7.00	16.00
18"	lf	130	8.50	16.00
21"	lf	120	9.00	20.00
24"	lf	155	9.00	30.00
30"	lf	400	12.00	40.00
CIP, 12"	lf	75	14.00	19.00
Inlets, cl E, combination	ea	9	400.00	400.00
	ea	4	520.00	300.00
Manholes	lf	100	50.00	40.00
frames & covers, 24"	ea	6	61.00	55.00
Conc sidewalks, approaches	sf	2,950	0.60	0.70
reinf, curbs on approaches	lf	300	3.30	4.00
type A curb	lf	150	4.00	3.50
Paved ditches	lf	320	1.10	3.00
Conc roadway, approaches	sy	45	10.00	10.00
slope protection	sy	185	10.00	12.00
Guard rail	lf	250	3.25	3.40
Top soil f&p	sy	5,900	0.30	0.31
Seeding & mulching slopes	sy	5,900	0.12	0.20
Solid sodding	sy	720	0.45	0.60
Sub foundation drilling	lf	50	1.50	3.00
Maintenance of traffic	ls	job	14,000	38,000

Completion schedule: 360 consecutive days
Liquidated damages: $500 day

THE BRUNTON* POCKET TRANSIT

IT'S HANDY...
weighs only 9 oz.; 2¾" x 3" x 1⅛"; easy to carry in pocket, on belt, in car.

IT'S VERSATILE...
ideal for preliminary and supplementary surveying; used as a compass, transit, level, plumb, alidade, clinometer. Shows direction to 1°; level, slope or grade within 1°.

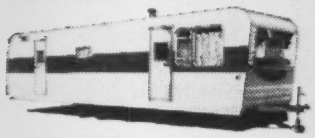
IT'S MADE TO LAST A LIFETIME
"Over 60,000 Brunton Transits since 1896"

See your local engineering supply house or WRITE FOR CATALOG

*Brunton is a registered trademark of

WM. AINSWORTH & SONS, INC.
2151 LAWRENCE ST. • DENVER 5, COLORADO

CONTRACTORS' TRAILERS



36 FEET COMPLETE $2495 FOB NYC

Equipped with toilet, water heater, desks, drafting table, floor heat, storms & screens thruout—many other features!
All Sizes Built to order.
High in quality—Low in Price!

NASSAU TRAILER & MOTOR SALES
2351 JERICHO TPKE.
Garden City Park, L.I., N.Y.
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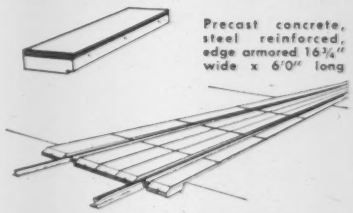
CROSSING SLABS



Precast concrete, steel reinforced, edge armored 16¾" wide x 6'0" long

WRITE FOR Bulletin X-540

For strength, durability, smooth riding qualities with minimum maintenance

PERMACRETE PRODUCTS CORPORATION
1839 South Wall Street, Columbus 7, Ohio

Greatest Truck Advance

Now available in Ford, GMC, Chevrolet . . . Allison "Automatic Brain"

It's the greatest truck transmission advance in 30 years.

It's the Allison fully automatic transmission —now available in leading trucks, school buses and other commercial vehicles.

No longer must the flow of power be disconnected from the wheels every time the driver changes gears. No longer must the whole drive line take a costly jolt with every shift. With the Allison Automatic, engine power is delivered to the wheels *smoothly* and *continuously*. This saves fuel on every shift. And it eliminates engine lugging and overspeeding.

It's a whole new idea in transmissions. It's actually more than a transmission—it's an "Automatic Brain."

What can it do for your trucks? Take your cue from what it is doing today:

A Rocky Mountain trucker cuts engine maintenance 50%

•

A West Coast contractor hauls 33⅓% more payload per trip

•

A Utah ore hauler cuts brake maintenance 75%

•

A Michigan car-haul drives 100 extra miles per day

•

An Eastern sand hauler makes 3 trucks do the work of 4

Allison

Transmission in 30 Years

and Dodge brings America A NEW KIND OF TRUCK

It can do the same for you.

Your driver merely selects the range—then the Allison "Automatic Brain" takes over.

It multiplies engine torque 15 times. It delivers maximum power right from a dead stop. It cushions the engine and drive line against costly shock damage.

Shifting is automatic, so engines *can't* lug or race. Engine life is increased 35%. It shifts instantly, *even under full power.*

Its direct-drive lockup engages in *every* forward gear for maximum fuel economy.

Its built-in Hydraulic Retarder permits faster—yet safer—descents on even the steepest grades—saves you 50% or more on brake maintenance.

The Allison Automatic was developed from more than 10 years' service in the heaviest military and off-highway vehicles.

Four leading truck makes—Ford, GMC, Chevrolet and Dodge—have engineered the Allison Automatic into their newest medium and heavy-duty trucks, school buses and other commercial vehicles. It is also available as an integral engine-transmission power plant from Chrysler and Ford Industrial Engine Divisions.

Before you buy another truck, find out how an Allison Fully Automatic Truck Transmission can repay its modest cost many times over in *your* trucking operation. See your dealer in Ford, GMC, Chevrolet and Dodge. Or write:

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana

FULLY AUTOMATIC TRUCK *Transmissions*

Materials and Labor Prices — Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Apr. 24; Next, May 22
- Clay Products, Lime, Plaster, Paint, Roofing: Last, May 1; Next, May 29
- Wage Rates, Building Board, Lath, Insulation: Last, May 1; Next, May 29
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, May 8; Next, Jun. 5

IRON AND STEEL PRODUCTS — PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS* billet	RIVETS ½-in. struc-tural	SHEET PILING Base	STEEL RAILS— Per Net Ton Standard	Light	TRACK SUPPLIES— Angle Bars	Std Spikes	Tie Plates	Track Bolts
Birmingham Area	$5.975	$5.10	$5.425	$12.25	.....	$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.275	5.10	5.425	12.25	$6.225	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	$14.75
Buffalo Area	5.275	5.10	5.425	12.25	6.225	110.50	130.00	6.975	9.75	6.60	14.75
Cleveland	.....	.....	5.425	12.25	6.225	.....	.....	.....	.....	.....	14.75
Youngstown Area	.....	.....	5.425	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.275	5.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.975	.....	6.125	.....	6.225	.....	.....	.....	9.75	6.75	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	69.75	9.75	6.60	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS — F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES— Per 100 lb. base price	REINFORCING BARS— Per 100 lb., base price 5 tons to carload lot New billet	Rail steel	EXPANDED METAL LATH— Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING— Per 100 sq ft., carload lots fob mill
Atlanta	$9.05	9.25	$9.01t	$52.00	$59.00	
Baltimore	9.45	8.45j		42.00	46.50	
Birmingham	8.64y	8.60y	8.60y	57.00p	63.00p	
Boston	9.63a	8.25	8.25	46.50	51.00	
Chicago	8.79E	6.88‡ 6.91gu	6.91gu	52.00‡	53.00‡	
Cincinnati	9.18ak	9.08rs	.....	43.50mn	48.00mn	
Cleveland	9.01	6.89c	.....	44.50‡	49.00‡	
Dallas	9.25	7.75	7.75	44.00	48.50	
Denver	9.84	8.95c	.....	57.00n	63.00n	
Detroit	9.18	7.15g	.....	45.00	49.50	
Kansas City	9.31a	8.10	.....	49.00	60.00	
Los Angeles	8.50fdR	7.35	.....	57.00	63.00	
Minneapolis	9.08d	9.26b	9.26b	42.50	46.00	
Montreal	7.90–8.60sC/8.20–8.90A	7.00/7.50FG	7.00/7.50FG	67.50h	70.20h	
New Orleans	.....	8.00gks	.....	47.00	52.00	
New York	9.45‡s	8.35y	8.35y	50.50m	57.00mo	
Philadelphia	8.80/9.00	7.80/8.00	.....	42.50‡	47.00‡	
Pittsburgh	8.64y	7.10y	.....	46.00‡w	49.50‡w	
St. Louis	9.10s	8.45c	8.45c	61.00l	62.00l	
San Francisco	9.50	9.45fj	.....	51.00	55.00	
Seattle	9.80sD	8.85e	.....	63.50mr	68.00mr	
Toronto	8.85*	7.85	7.85	61.60mq	66.00mq	

EXTRAS, per cwt: ♦Quantity (applies to L/T, shipments only): under 1,000#, +$1.80; 1000-1999#, +$1.20; 2000-4999#, +$1.20; 5000-9999#, +90¢; 10,000-19,999#, +60¢; 20,000-29,999#, +30¢; 30,000-39,999#, +10¢; 40,000# & up, none. ♦Size†: #2 +$2.50; #3 + $1.40; #4 +$1.00; #5 +70¢; #6, #7, #8, #9, #10, #11 +50¢. ♦Bending: heavy, +90¢; light +$2.20 (except in New York City and surrounding metropolitan area where bending must be done on the job). ♦Engineering (details and placing from designs by others): over 500 tons, +45¢; 200-499 tons, +50¢ but not over $1500; 75-199 tons, +65¢ but not over $2000; 20-74 tons, +75¢ but not over $975; 5-19 tons, +85¢ but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60¢.

Quantity extras, per cwt: under 100#, +$2.30; 100-399#, +$1.85; 400-999#, +$1.50; 1000-1999#, +1.00; 2000-4999#, base price; 5000-9999#, −10¢; 10,000-19,999#, −30¢; 20,000-29,999#, −60¢; 30,000# and up, −70¢

4 × 16 in., No. 5 & 10 wire— Joliet, Ill., Donora, Pa., Monessen, Pa $3.08

4 × 12 in., No. 8 & 12 wire— Joliet, Ill., Donora, Pa., Monessen, Pa $3.62

6 × 6 in., No. 6 & 6 wire— Joliet, Ill., Donora, Pa., Monessen, Pa $4.17

♦‡ Delivered. ♦* Aver. of Canadian & American. ♦a 2000–9999#. ♦b 10,000–15,999#, fob city. ♦c 20 tons or over. ♦d 10,000–19,999#. ♦e Intermediate struct'l. ♦f Incl. delivering in free zone. ♦g CL. ♦h list price; dominion tax exempt; add provincial and municipal taxes. ♦i add dominion, provincial and municipal sales taxes. ♦j intermediate and hard grade. ♦k fob city. ♦l delivered; contractor to do unloading. ♦m copper alloy. ♦n LCL. ♦o asphalt coated. ♦p del. of 500 sq. yd. or more. ♦q 3 lb. ♦r 2% off for cash. ♦s 2,000–4,999#. ♦t add 18.5¢ del. ♦u add 7.5¢ switch. ♦v incl 15¢ del. ♦w truck lots. ♦y add 15¢ del. ♦z add 10¢ del. ♦A American made. ♦C Canadian made. ♦D ½% for cash. ♦E 30,000 # or over. ♦F Federal tax exempt. ♦G add 10¢ switch. ♦R: revised

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXa	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Press Cl. 150	Cl. 1500	12" Sew Cl. 2400	CLAY SEWER PIPE Per ft., delivered ASTM C13-54 8 in.	12 in.	ASTM C200-55T 24 in.	36 in.	CLAY DRAIN TILE† Per 1,000 ft., car load lots, f.o.b. ASTM C4-55 6 in.	8 in.	CONCRETE SEWER PIPE§ Per ft., delivered ASTMC 14-55 12 in.	24 in.
Atlanta	130.5	$1.56	1.64	$2.36	2.68	$.53	$.98	$	$	$209.00s	$334.00	$1.55m	$4.40m
Baltimore	140.4	1.56	1.64	2.19	2.54	.665	1.28	5.08r	12.71	187.80	289.20	1.01	2.75m
Birmingham	125.8	1.56	1.64	2.26	2.62	.46	.86	3.70w	10.37w	260.00‡	440.00‡	1.25m	2.75
Boston	143.5	1.58	1.66	2.19	2.54	.763qrt	1.4715qrt	6.075qrt	.....	215.40r	330.60r	1.56mg	3.47mg
Chicago	140.9	1.56	1.64	2.19	2.54	.93m	1.78m	7.52m	21.16m	220.00m	330.00m	1.30	4.00
Cincinnati	135.5	1.58	1.66	2.19	2.54	.665t	1.2825t	4.905t	12.505	240.00	370.00	.85m	3.25m
Cleveland	141.7	1.58	1.66	2.19	2.54	.567s	1.0935s	4.545t	11.7875t	155.40m	240.60m	.85m	3.50m
Dallas	137.8	1.58	1.66	2.26	2.62	.537	.955	4.382b	9.72b	.....	.....	1.17	2.52
Denver	148.2	1.79	1.73	2.36	2.68	.45n	.87n	3.73n	.....	.....	.....	.75m	2.75m
Detroit	142.1	1.58	1.66	2.19	2.54	.90m	1.70n	6.80n	18.50n	164.80m	254.20m	1.10	4.05
Kansas City	138.5	1.60	1.66	2.26	2.62	.61	1.105	5.694b	13.08	278.00	493.00	.95	2.90
Los Angeles	148.6	1.65	1.73	2.19	2.54	.74bl	1.61bl	6.42bl	15.36bl	370.00l	530.00l	1.12	3.32f
Minneapolis	149.9	1.60	1.68	2.26	2.62	.86mo	1.55mo	6.70mo	.....	.....	.....	2.13h	5.74h
Montreal						1.13u	2.00u	7.50u	13.50u	288.00	545.00	1.17h	3.11f
New Orleans	133.3	1.56	1.64	2.26	2.62	.528	.983	5.10	.....	210.50p	468.00	.85	2.90
New York	138.7	1.58	1.66	2.19	2.54	1.02	1.94	7.56	19.48	.....	.....	1.50	3.00
Philadelphia	138.0	1.56	1.64	2.19	2.54	.68	1.31	5.13e	14.25e	300.00‡	350.00‡	1.75h	4.20h
Pittsburgh	142.9	1.58	1.66	2.19	2.54	.595m	1.15m	4.73m	12.40m	190.00	295.00	1.66z	3.93z
St. Louis	136.9	1.56	1.64	2.26	2.62	.59	1.08	4.45	10.80	180.00l	380.00l	1.45il	3.10il
San Francisco	148.6	1.65	1.73	2.19	2.54	.78d	1.69d	6.72d	16.36d	320.00l	560.00l	1.05m	3.30m
Seattle	149.0	1.65	1.73	2.19	2.54	.67b	1.33b	6.84	.....	220.00c	.....	1.95ky	4.75ky
Toronto	.....	.....	.....	.....	.....	.80	1.50	6.00	.....	157.00	280.00	.92	3.21

♦‡ Extra quality. ♦‡ delivered. ♦a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 125.8; Burlington, N. J., 134.6. ♦b Extra strength. ♦c 4-in., $130. ♦d SS361-A. ♦f 21 in. ♦g culvert pipe; reinf., ASTM C 75-56. ♦h reinf., ASTM C 75-54. ♦i reinf., ASTM C 76-55. ♦j centrispun; no standard specs. in Canada. ♦k 2% cash. ♦l fob plant. ♦m truck del. ♦n LCL del., fob truck. ♦o listed price based on LCL (no min.). ♦p freight allowed to destination in city. ♦q ASTM C 13-40. ♦r CL fob origin, freight allowed. ♦s 1 ft lengths. ♦t 3 ft lengths. ♦u CESA A 60-1941. ♦v standard strength. ♦w SS; add 20% for d.s. ♦x fob city. ♦y Reinforced

♦WROUGHT STEEL PIPE

(Full standard weight)

Discount from list; see footnote

Mill	3½ to 8 in., Lap Weld+ Black %	Galv. %	2½ & 3 in., Butt Weld+ Black %	Galv. %
Lorain, Ohio	6.25a	+8.00a	16.75	0.50
Aliquippa, Pa	6.25	†	16.75	3.00
Sparrows Pt., Md.	5.25ab	+11.50a	14.75	1.50
Benwood, W. Va	6.25	+10.50a	16.75	0.50
Youngstown, O	6.25	+10.50a	16.75	0.50
Indiana Harbor, Ind.	4.50d	+9.75d	15.75	0.50
Sharon, Pa.	6.25a	+10.50a	16.75	0.50
Wheatland, Pa	6.25	+10.50a	16.75	0.50
Etna, Pa	4.50d	+9.75d	16.75	3.00
Fontana, Calif.	+7.25ab	+24.00ab	+13.00	3.25

a 3½ to 4 in. b Continuous weld. 5 and 6 in. d 6 in. +Threaded and coupled. † Production discontinued

♦ WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft. (based on approx. $200 per net ton): Butt Weld ⅛ in., 8½¢; ¼ in., 8¢; ⅜ in., 8¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 78½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight, 3% transport tax for destination price. † Production discontinued November 1957

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 65.54, galv., + 95.77; 1¼ in. black, + 65.54, galv., + 95.23, 1½ in. black, + 61.79 galv., + 91.22; Lap Weld —2½ in. to 3 in. black + 67.95 galv. + 95.77; 4½ in. to 6 in. black + 64.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

Gets 21-yard loads in 34 seconds . . . . . . moves 285 bank yards per hour with S-18 "Eucs"

The first Interstate Highway contract in New Jersey was awarded to Public Constructors, Inc. of Gloucester, New Jersey. Started in September 1957, it is scheduled for completion in one year.

For the 800,000 yards of excavation, Public Constructors selected seven Euclid S-18 Scrapers with Torqmatic Drive. Working 58 hours per week, these "Eucs" completed 40% of the earthmoving during the first month of operation.

Each of three S-18's in one spread averaged nearly 13 trips per hour on a 2450' cycle under adverse load, haul and dump conditions. Payloads averaged over 14 bank yards of very hard ripped rock containing chunks up to 4' in diameter.

On another section of the job with more favorable conditions and with a Euclid TC-12 Crawler pushing, the S-18 Scrapers loaded out 21 loose yards of gravel, clay and decomposed shale in 34 seconds. Making the 3200' cycle in 3.84 minutes, hourly production per unit averaged 285 bank yards.

The variety of loading and hauling conditions on this job points up the advantages of Euclid Scrapers with Torqmatic Drive. Maximum usuable traction and power to meet continually changing grades and rolling resistance are provided automatically. The operator doesn't have to clutch and down-shift for grades and soft spots on the haul or fill—there's no gear-shift guesswork so cycle time is kept to the minimum. Heavy construction of the bowl and tractor frame enables the "Eucs" to withstand pushloading by the biggest crawlers in the most difficult materials.

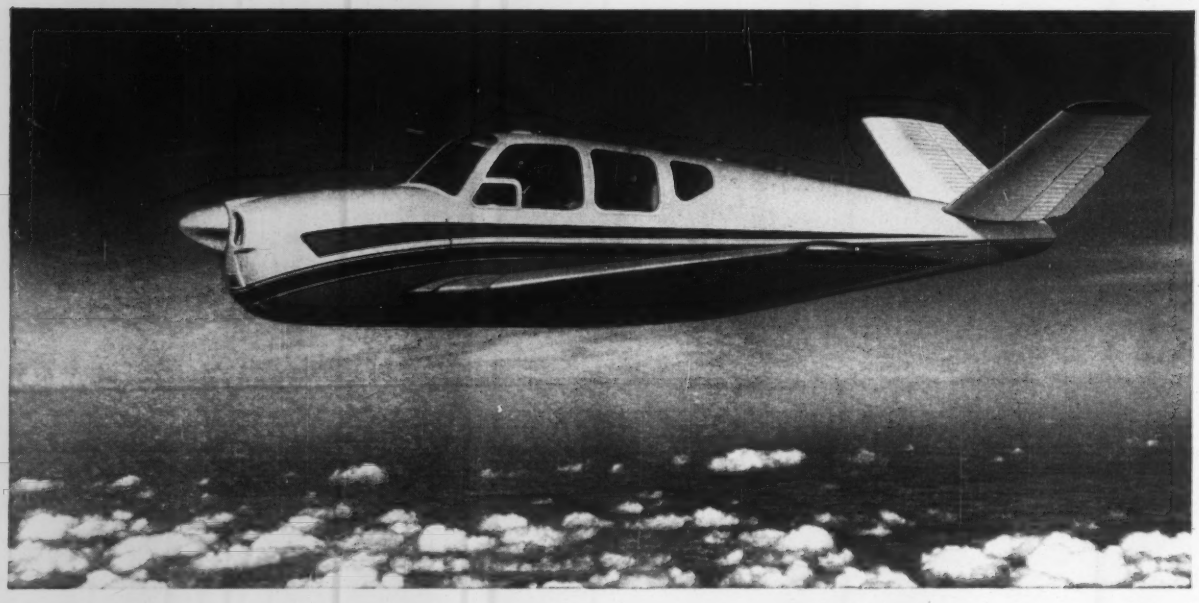
Before you decide on any scraper for present or future work, check the money-saving features of these "Eucs". Your dealer has facts and figures that show why so many users have proved that ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

GM GENERAL MOTORS EUCLID

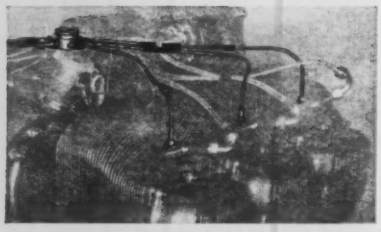
EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE



Get there FAST in a '58 Beechcraft Bonanza

. . . FIRST with fuel injection



'58 BONANZA'S NEW ENGINE WITH FUEL INJECTION

GO FARTHER—FASTER

The four-place *Beechcraft* Bonanza
RANGE – up to 1,060 miles nonstop
SPEED – up to 210 miles per hour

Tomorrow's power — fuel injection — is yours today in the New Beechcraft Bonanza for '58! For the first time in commercial aviation, the magic of fuel injection gives smoother performance and 200 miles per hour cruising speed with the Bonanza's new 250 horsepower engine.

Now you can go faster, get there earlier, get more done than ever before. And you'll enjoy the supreme quiet and comfort of the Bonanza cabin as you watch the miles hurry by.

The '58 Beechcraft Bonanza is at least 30 miles per hour faster than any other single-engine commercial airplane. This rugged and right airplane uses less fuel than your family car, and no airplane is easier to fly!

Beechcraft

For information about the **Bonanza** and the finest leasing and financing plans in aviation, see your Beechcraft distributor or dealer, or write Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

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NEW ENGLAND

BUILDINGS—BA

▲ Mass., Worcester—DORMITORY, etc.—BA 5/21—Clark University, 950 Main St., men's dormitory-women's dormitory and student center. $1,500,000. Plans deposit $150. Hoyle, Doran & Berry, 248 Boylston St., Boston, archts. CD 8/28.

▲ Mass., Boston—OFFICE—BA 5/23—Blue Cross & Blue Shield, 38 Chauncy St., Boston, office, 127 Federal St. $2,500,000-$3,000,000. Rudolph-Anderson, Beckwith & Haible, 11 Beacon St., archts. CD 10/19/56.

▲ R. I., Providence—SCHOOL—BA 5/26—Bd. Contr. & Supply, City Hall, Joslin St. Elementary School. $1,500,000. Howe, Prout & Ekman, 17 Custom House St., archts. CD 12/4/56.

▲ Mass., Worcester—SCHOOL—BA 5/28—City, School Dpt., Chamber Commerce Bldg., high school, Grove and Forest Sts. $2,500,000. Plans deposit $100. C. W. Buckley, Inc., 311 Main St., archt. CD 12/7/56.

HEAVY CONSTRUCTION—LB & CA

▲ MAINE—State Hy. Comn., Augusta, Bids opened 4/30,
W. H. Hinman, Inc., North Anson, Me., CA $2,350,338 (5 bidders), Tukey's Bridge in Portland, FAP No. I-B95-3 (4) 50, Cumberland Co. CD 4/14.

▲† Perini Corp., 73 Mt. Waite Ave., Framingham, Mass. LB $4,012,418 est. $5,193,029 constr. North Hartland Dam and appurtenant structures Ottauquechee River in towns of Hartland, and Hartford, Windsor Co., ENG-19-016-58-60, VERMONT. U. S. Eng., 150 Causeway St., Boston 14, Mass. Bids May 1. CD 3/21, under LB.

▲† Perini Corp., 73 Mt. Wayte Ave., Framingham, Mass. CA $3,143,450, est. $3,889,435 North Springfield Dam and appurtenant structures Black River Stage 11, outlet works, intake tower, rein.-con. tunnel and utilities, ENG-19-16-58-36, North Springfield, VERMONT. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 17. CD 4/21, under LB.

▲† The Arundel Corp., 334 Furman St., Brooklyn, N. Y., CA $3,184,200, est. $2,653,500, imprvt. dredging Fore River, CIVENG-19-016-58-63, Weymouth, MASSACHUSETTS. U. S. Eng., 150 Causeway St., Boston 14, Mass. Bids Apr. 16. CD 4/21, under LB.

▲ RHODE ISLAND—State R. I. & Prov. Plants, State House, Providence,
M. A. Gamino Constr. Co., 728 Valley St., Providence, R. I. CA $4,881,481, R.I. Bid No. 783 Contr. No. 5801, East Providence Expressway and East Shore Expressway link between Wampanoag Trail, East Providence, Charles A. Maguire & Assocs., 11 Turks Head Bldg., Providence, engrs. Bids Apr. 9. CD 4/14, under LB.

BUILDINGS—LB & CA

▲† Vara Constr. Inc., 718 Huntington Ave., Boston, Mass., CA $1,322,660, est. $1,296,185, NUCLEAR REACTOR FACILITIES, Watertown Arsenal, ENG-19-016-58-113, WATERTOWN, MASS. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 2. CD 4/14, under LB.

▲ Park Constr. Co., Inc., 40 Court St., Boston, Mass., CA $4,037,717, est. $4,000,000, HOSPITAL addns., 71 Jaques Ave., WORCESTER, MASS. City, City Hospital, 71 Jaques Ave., Worcester, Mass. Bids Mar. 6. CD 3/11, under LB.

▲ Jarvis Constr. Co., 283 E. Main St., Manchester, Conn., CA $1,548,000, 90 HOUSES "Woodhill Heights", Woodland St., MANCHESTER, CONN. Jarvis Realty Co., 283 E. Center St., Manchester, Conn. Awarded May 2. CD 7/27/56.

MIDDLE ATLANTIC

BUILDINGS—BA

▲† N. Y., Niagara Falls—HOUSING—BA 5/20—Procurement Officer, Niagara Air Force Base, Niagara Falls, 290 units Capehart Housing at Niagara Air Force Base. Over $4,000,000. Highland & Highland, 522 Franklin, Buffalo, Zone 2, archts. CD 4/15.

▲ D. C., Wash.—HOUSING—BA 6/3—National Capitol Housing Auth., 1729 New York Ave. N. W., 200-unit Housing Project No. DC-1-23, Stoddert Terrace, located Ridge Rd. S. E. between Anacostia Ave., and O. St. $2,000,000. Plans deposit $50. Denton & Duane, 1300 Connecticut Ave. N. W., archts. CD 7/19/55.

▲† N. Y., Newburgh—HOUSING—BA On Or About 6/5—Base Procurement Officer, Base Theater, Bldg. No. 902-3, Stewart Air Force Base, Armed Services Housing, 300 family housing units at Stewart Air Force Base, Inv. No. 30-603-58-87. Plans deposit $50. CD 2/13/52.

HEAVY CONSTRUCTION—LB & CA

▲† Dravo Corp., Neville Island, Pittsburgh 28, Pa. CA $2,497,047 converting fixed crest concrete dam to movable crest straightening river wall and miter sills of existing lock, Lock and Dam 8 of the Monongahela River between Point Marion Pa. and Morgantown, W. Va., PENNSYLVANIA. U. S. Eng., 925 New Federal Bldg., Pittsburgh, Pa. CD 9/12.

▲† Piracci Constr. Co., Old Annapolis Blvd. and Marley Creek Rd., Baltimore 3, Md. LB $3,446,470 (6 bidders) 3 story, rein.-con. depot operations bldg. Olmsted Air Force Base, ENG-18-020-58-14, MIDDLETOWN, PA. U. S. Eng., 24th St. and Maryland Ave., Baltimore, Md. Bids Apr. 30. CD 4/8.

▲† Nello L. Teer Co., Durham, N. C., CA $1,923,581, Base Bid, (FY 57) M.C.P., Runway primary inst. extension at Andrews Air Force Base, ENG-49-080-59-39—(38), ANDREWS AIR FORCE BASE, MD. U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C. Bids Apr. 29, under LB. CD 5/1.

BUILDINGS—LB & CA

▲ Caristo Constr. Corp., 26 Court St., Brooklyn 2, N. Y., CA $1,260,000, general constr. plumbing and drainage heating and ventilating, electrical work and lighting fixtures PUBLIC SCHOOL 256, Lafayette and Marcy Aves. and Kosiusko St., Brooklyn Boro, BROOKLYN, N. Y. Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, N. Y. Bids Apr 15. CD 4/17, under LB.

▲ Wilaka Constr. Co. Inc., 11 E. 44 St., New York 17, N. Y., LB $1,429,000 (4 bidders), general constr., heating and ventilating, electrical work and lighting fixtures for new PUBLIC SCHOOL 297, Park Ave., Floyd St. and Tompkins Ave., BROOKLYN, N. Y. Bureau Constr. Bldg. Educ., 42-12 Crescent St., Long Island City 1, N. Y. Bids May 2. CD 4/25.

▲ Psaty & Fuhrman, Inc., 369 Lexington Ave., New York 17 N. Y., LB $2,959,000 (15 bidders), general contract MUSIC and ARTS BLDG. at Queens College, FLUSHING, N. Y. Bd. Higher Educ., Queens College, Bus. Office Bldg. H, 65-30 Kissena Blvd., New York, Zone 67, N. Y. Bids May 1. CD 4/3;
Heating Maintenance Corp., 220 E. 138 St., New York 51, N. Y., LB $597,000 (10 bidders), heating and ventilating for Music & Arts Bldg. (Flushing, N. Y.);
Teman Bros., 2 Chester St., Brooklyn 12, N. Y., LB $727,500 (19 bidders), electrical work for Music & Arts Bldg. (Flushing, N. Y.)

▲ Caristo Constr. Corp., 26 Court St., Brooklyn 2, N. Y., CA $1,706,000, general constr., plumbing and drainage, heating and ventilating, electrical work and lighting fixtures PUBLIC SCHOOL 150, Fox and Tiffany Sts., Bronx Boro, NEW YORK, N. Y. Bureau Constr., Bd. Educ., 42-15 Crescent St., Long Island City, N. Y. Bids Apr. 8. CD 4/10, under LB.

▲ Planet Constr. Corp., 11 W. 42 St., New York 36, N. Y., CA $3,674,000, general contract HIGH SCHOOL of INDUSTRIAL ARTS and PUBLIC SCHOOL 59, west side of Second Ave. between 56 and 57 Sts., Manhattan Boro, NEW YORK, N. Y. Bureau Constr. Bd. Educ., 42-15 Crescent St., Long Island City 1, N. Y. Bids Mar. 26. CD 3/28, under LB;
John G. Hellman Co. Inc., 507 E. 76 St., New York 21, N. Y., CA $687,500, electrical work (New York, N. Y.)

▲ Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. J., CA Est. $4,000,000, incl. land and equip., design and construct 3 story RESEARCH LABORATORY, on 45 acre tract on Boston Post Rd., RYE, N. Y. Sloane Kettering Institute for Cancer Research, 410 E. 68 St., New York, N. Y.

▲ Dean Constr. Co., Inc., 29-28 41 Ave., Long Island City, N. Y., CA $2,950,000, Base Bid, SENIOR HIGH SCHOOL, WHITE PLAINS, N. Y. Bd. Educ., 279 Hamilton Ave., White Plains, N. Y. Bids Apr. 7. CD 4/18, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

▲† Kentucky—BA 5/21—U. S. Eng., P. O. Box 2127, Huntington 18, W. Va., dam, guard walls and lock emergency gates for Greenup Locks and Dam, Ohio River, at Greenup, Serial No. CIVENG-46-022-58-45. Extended date. CD 4/8.

BUILDINGS—BA

▲ La., Opelousas—HOUSING—BA 5/22—City Housing Auth., Yorick Chachire, dir., Opelousas, constr. 140 brick veneer low-rent housing. $1,535,800. Plans deposit $25. Extended date, Matkin & Fitch, 3105 Ryan St., Box 5517 Drew Station, Lake Charles, La., archts. CD 4/15.

▲ Ky., Lexington—POWER PLANT TUNNEL—BA 6/6—Commonwealth of Ky., Div. Purchases, Frankfort, power plant tunnel and facilities for University of Kentucky Medical School. $2,000,000. Meriwether-Marye & Assoc., 248 E. Short St., archts. Procter Ingles, 915 S. Limestone St., engrs. CD 10/1/56.

HEAVY CONSTRUCTION—LB & CA

▲ NORTH CAROLINA—State Hy. Comn., Raleigh, Bids opened Apr. 29.
N. C.—E. B. Towles Constr. Co., Inc., Box 1617, Wilmington, N. C. LB $189,919, est. $175,000-$200,000, subgrade reinf. and sand asphalt base and surface, 8.92 mi. NC 87, Proj. 8.13153 DOAD-4-4, Brunswick Co.; LB $236,092, est. $200,000-$225,000, S.A. surface and bit. concrete binder and surface, 29.8 mi. US 74 and 76 NC 130 county rds., Proj. 7.431149, BS 7.431150 BS 7.432045 BS 7.432046, Columbus Co.;
N. C.—Thompson-Arthur Paving Co., Box 1197, Greensboro, N. C. LB $369,952, est. $250,000-$300,000 SABC and BST 2.97 mi. NC 54, Proj. 8.14613 S-891 (2), Orange Co.; LB $196,238, est. $150,000-$200,000, CABC (shoulders) and b. conc. binder and surface 8.87 mi. US 501, Proj. 8.14655 F-21 (8), Person Co.;
N. C.—Sam Finley, Inc., 1615 S. Cleveland Ave. SW., Roanoke, Va. LB $387,833, est. $300,000-$400,000, CABC (shoulders) and b. conc. binder and surface 11.48 mi. US 64 Proj. 8.15213 S-645 (11), Davidson Co.; LB $333,121, est. $300,000-$400,000, CABC (shoulders) and b. conc. binder and surface, 14.83 mi. US 52, Proj. 8.17460, F-490-B, F-177 (7) Surry Co.;
N. C.—Crowell Constructors, Inc., Box 3406, Fayetteville, N. C. LB $332,212, est. $300,000-$400,000, STBC, b. conc. binder and surface, curb and gutter and culvert, 2.98 mi. Proj. 8.13452, Cumberland Co.;
N. C.—Dickerson, Inc., Monroe, N. C. LB $449,749, est. $400,000-$500,000, STBC S.A. base and surface 12.8 mi. NC 41, Proj. 8.13832, Robeson and Bladen Counties;
N. C.—Gilbert Eng. Co., Statesville, N. C. LB $545,830, est. $300,000-$400,000, grading, 5.92 mi. US 220, relocation of US 220, by-passing Madison and Mayodan, Proj. 8.15902, Rockingham Co. CD 4/23;
N. C.—Rea Constr. Co., Box 3725, Charlotte, N. C. LB $258,744, est. $225,000-$250,000, CABC (shoulders) and b. conc. binder and surface, 9.78 mi. NC 49, Proj. 8.16176, F-638 (7), Cabarrus Co.;
N. C.—Propst Constr. Co., Box 752, Concord, N. C. LB $758,326, est. exceeds $500,000, SABC-BST and b. conc. binder and surface, 11.05 mi. US 74, Proj. 8.18239, U-150 (12) F-150 (11), Cleveland Co.;
N. C.—W. E. Graham & Sons, Box 268, Cleveland, N. C., LB $1,429,121, est. exceed $500,000, grading 8.93 mi. US 70, Proj. 8.18525 1-700 (20), Burke and McDowell Counties;
N. C.—Ballenger Paving Co., Box 927, Greenville, S. C., LB $433,182, est. $300,000-$400,000 CABC (shoul-

(Continued on page 160)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**
PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

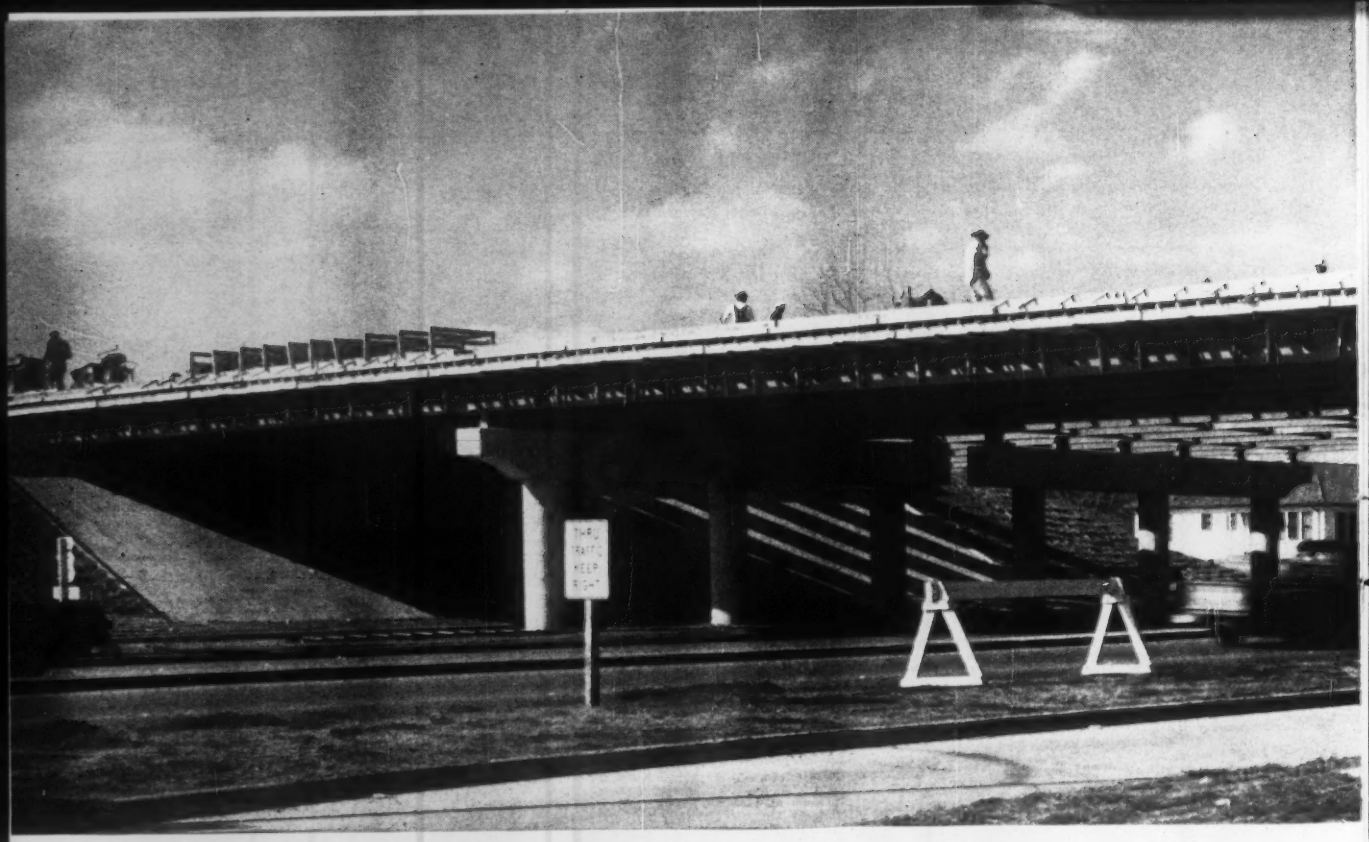
CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.



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Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Warehouse Distributors
United States Steel Export Company

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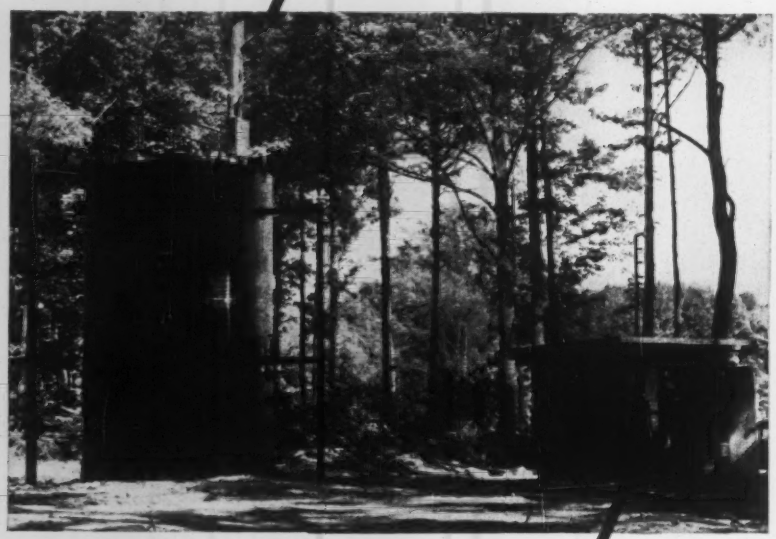

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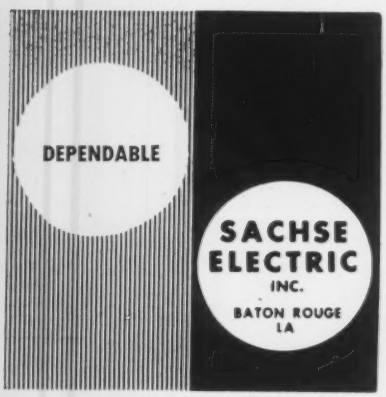


(Continued from page 157)

ders) and b. conc. binder and surface, 12.53 mi. US 23 and 441, Proj. 8.19623, F-707 (2) Macon Co.;

N. C.—**Asheville Paving Co.**, Box 7068, Asheville, N. C. LB $289,573, est. $250,000-$300,000, CABX (shoulders) and b. conc. binder and surface, 11.09 mi. US 64 Proj. 8.19907 F-69 (5) F-195 (4) Transylvania and Henderson Counties. CD 4/14.

▲ SOUTH CAROLINA—State Hy. Dpt., Hotel Jefferson, Columbia,

Sloan Constr. Co., Inc., Peoples National Bank Bldg., Greenville, S. C., CA $1,492,042, base and b. conc. surf. 11.22 mi. for 4 lane divided hy. Int. Rte. 85 from Rd. 41 to Pacolet River, S. C. Docket No. 42.485, F.A. Projs. Nos. IN-301-1 (2) and I-301-2 (9), Spartanburg Co. Bids Apr. 15. CD 4/23, under LB.

▲ FLORIDA—State Rd. Dpt. Office, Room 228, Holland Bldg., Tallahassee, Bids opened 4/29.

Fla.—**Zinke Smith, Inc.**, Box 2004, Pompano Beach, Fla., LB $346,656, est. $325,000 (10 bidders) Type 1 b. conc. surface course with binder course, constr. 2 four-lane bridges 60 ft. and 90 ft. in length of prestressed slab decks on prestressed composite concrete and steel pile bents, aluminum handrail, 3.925 mi. from Moody Dr. north of Homestead Air Force Base, north to SR 5, Proj. 8757-155, South Allapattah Rd., Dade Co.

Fla.—**W. H. Armston Co., Inc.**, Dunedin, Fla., LB $2,821,624, est. $3,000,000 (5 bidders) extra heavy embankment, rock base with Type 1 b. conc. surface course binder course; constr. 292 ft. concrete deck grade separation bridge with aluminum hand-rails on concrete piling; concrete sheet pile bulkhead drainage structure; fencing and incid. items 3.517 mi. between east end of Mid-Bay Bridge and point approx. 3.5 mi. east, Fed. Aid. Projs. 1-41-1(20) (1-10410) Job No. 1019-406, and State Job No. 1027-105 SR 400 and 60, Hillsborough Co.;

Fla.—**James H. Craggs Constr. Co.**, Box 22, Gainesville, Fla., LB $731,427, est. $600,000 (5 bidders) limerock base, primed; limerock base wid'n strips and minimum limerock overbuild; Type 1 b. conc. surf. course with binder course; storm sewers 1.991 mi. Kuhl Ave. from Jenniejewel Dr. south of Orlando north to Gore Ave. in Orlando, Proj. No. 7504-109 SR 527, Orange Co.;

Fla.—**Coggin & Deermont**, Chipley, Fla., LB $234,767 est. $250,000 (9 bidders) sand-clay base, primed type 2 surf. treatment, 6.863 mi. southwest of De-Funiak Springs, from SR 83 via steel Church to SRS-280, Proj. No. 6068, -150, SR S-278, Walton Co. A. C. Church, State Hy. Engr., Tallahassee, Fla. CD 4/17/58.

▲ **Troup Bros., Inc.**, 4151 S. Dixie Hy., Miami, Fla., LB $1,644,663, Contr. 3-C, grading, paving and utilities for automobile parking lots and access roads, Miami International Airport, MIAMI, FLA. Bd. of Comrs. Dade Co. Port Auth., Court House, Miami, Fla. Bids Apr. 29. CD 4/16.

BUILDINGS—LB & CA

▲† **Albert Gersten & Assocs.**, P. O. Box 187, Beaufort, S. C. (Home Office, Beverly Hills, Calif.) LB $8,881,000. (6 bidders) constr. 618 family HOUSING units (Capehart) ENG-49-080-58-8 (7) FORT BELVOIR, VA. U. S. Eng., 1st and Douglas Sts. N.W., Wash., D. C. Bids May 1. CD 3/26.

▲ **Wm. A. Berbusse, Jr., Inc.**, 322 Royal Palm Way, Palm Beach, Fla., LB $1,335,000 (13 bidders) 44 x 307 ft. structural steel, MEMORIAL HOSPITAL Addn., paving, etc., SARASOTA, FLA. County Hospital Bd., Mrs. Lota Mundy, chn., Sarasota, Fla. Kannenberg & Hannebuth, 1422 Second St., Sarasota, Fla., archts. Bids Apr. 20. CD 4/4.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲ **Ind., Bloomington**—STADIUM—BA 5/22—Bd. Trustees Indiana University, J. A. Franklin, vice pres., Bloomington, stadium to be located north of campus. $12,000,000. Plans deposit $150. Eggers & Higgins, 100 East 42 St., New York 17, N. Y., archts. CD 3/7, under LB.

BUILDINGS—BA

▲ **Wis., Madison**—DORMITORIES, etc.—BA 5/29—Wisconsin University Bldg. Corp., 3 men's dormitories and dining hall, $3,600,000. Plans deposit $50. Mittlebusher & Tourtelot, 36 S. State St., Chicago, Ill., archts. CD 11/29.

▲ **O., Cleveland**—MINE DEVELOPMENT—BA 6/1—International Salt Co., Scranton Life Bldg., Scranton 3 Pa., shafts for salt mine on Whiskey Island in Cleveland Flats. Total est. $10,000,000 CD 7/30.

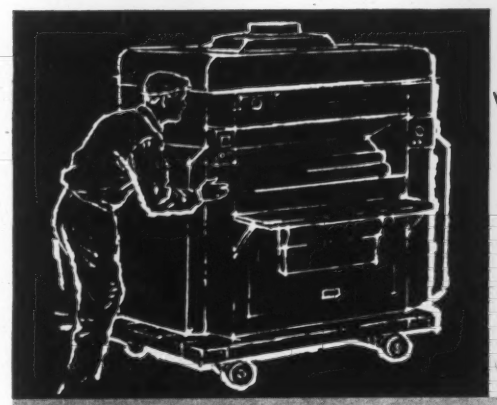
HEAVY CONSTRUCTION—LB & CA

▲† **Peter Kiewit Sons Co.**, 1024 Omaha National Bank Bldg., Omaha, Neb., CA $1,976,572, est. $1,926,836 (10 bidders) constr. New Richmond Cofferdam, Locks New Richmond Locks and Dam Proj., Ohio River, near Chilo, O., Clermont and Braken Counties, ENG-46-022-58-41, OHIO-KENTUCKuY. U. S. Eng., 237 4th Ave., Huntington 18, W. Va. Bids Apr. 24, awarded Apr. 29. CD 4/29, under LB.

▲ **Mather Constr. Co.**, P. O. Box 388, Jeffersonville, Ind., LB $442,345, Contr. D, 4,400 lin. ft. 24 to 54 in. rein.-con. pipe, 26,300 lin. ft. 12 to 21 in. vitr. clay. East Side Trunk and branch sewers; LB $305,863, Contr. E. 3,500 lin. ft. 24 to 54 in. rein.-con. pipe, 26,300 lin. ft. 12 to 21 in. vitr. clay, West Side trunk and branch sewers, NEW ALBANY, IND. City, Bd. P. Wks., New Albany, Ind. Bids Apr. 29. CD 3/28.

Fruin-Colnon Contr. Co., 1595 E. Epler St., Indianapolis, Ind., and **C. C. Contg. Co.**, 2001 E. Pontiac St.,

(Continued on page 163)



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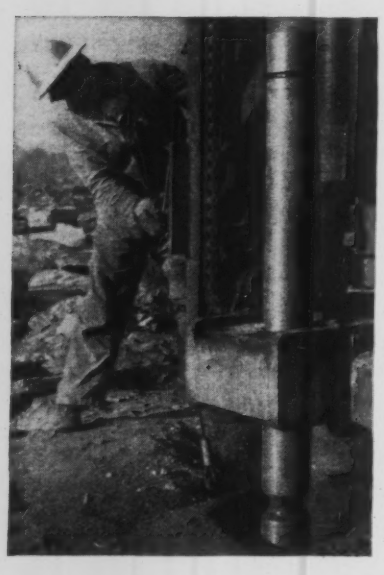
Bottom-hole drilling in hard rock up to 35 ft./hour



Here's the fastest-drilling tool you've ever seen for making hole in hard rock. Penetration rates vary with the rock, but average rates for the Schramm Rotatool are 15-20 feet per hour in hard rock and 25-30 feet in hard limestone. Reason: Rotatool combines the crushing power of a rock drill with the speed and efficiency of a rotary drill to give you a bottom-hole percussion tool to produce maximum fracturing action.

Rotatools are available in two sizes: The larger, for Truck and Crawler Mounted Rotadrills, takes 6" and 6½" bits and requires 350 cfm of air @ 100 psi. The smaller, for Pneumatractor Mounted Rotadrills, takes a 4½" bit and requires 100 cfm @ 100 psi.

Heavier hammer delivers more crushing energy per blow for better breakage, faster penetration.

Full force of tool at bottom of the hole—none lost through drill pipe.

Instant impact delivered to the bit for greater power—makes fast, deep holes where many drills are stopped.

Clears hole of cuttings and/or water by passing full capacity of compressor plus stored air through the end of the bit . . . not restricted as in other tools.

Straighter, cleaner holes.

Full information about the Schramm Rotatool is contained in the New Bulletin SRT-58. Write for your copy today.

See the Yellow Pages for local Sales, Service and Rental of Schramm Air Compressors.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

620 N. Garfield Ave. • West Chester, Pa.

(Continued from page 160)

Fort Wayne, Ind. (joint venture), LB $1,709,490 (12 bidders), Contr. A, primary sedimentation type, vacuum filtration, fast drying raw sludge incinerator 6.3 m.g. p.d. capacity (New Albany, Ind.);
Upton Pry, 2054 McDonald St., New Albany, Ind., LB $138,870, Contr. B, 3 sewage pumping stations, (New Albany, Ind.).
W. H. Joiner, New Castle, Ind., LB $638,665, Contr. C, 17,000 lin. ft. 24 to 54 in. rein.-con. pipe, 7,000 lin. ft. 12 to 21 in. vitr. clay, Crosstown Interceptor and relief sewers (New Albany, Ind.).

▲ ILLINOIS—Illinois State Toll Highway, 20 N. Wacker Dr., Chicago,
Meade Electric Co., 5401 W. Harrison St., Chicago, Ill., CA $1,834,500, highway lighting sys. Cont. L1b at 25 interchanges, 7 toll plazas and 3 service area, Cook Co. CD 4/25, under LB.

▲ MICHIGAN—State Hy. Dpt., John C. Mackie, comr., Stevens T. Mason Bldg., Lansing, Bids opened 4/23,
Mich.—C. J. Rogers, Inc., 14836 Grand River Ave., Detroit, Cooke Contg. Co., 1116 Penobscot Bldg., Detroit, and Jutton-Kelly Co., K & M Bldg. Co., Dearborn, Mich., (joint venture) LB $1,889,228, grading, drainage structures, surf. 0.57 mi. also 3 rein.-con. and steel bridges Edsel Ford Expressway, located at Moran, Harper and Moross Aves., Detroit, Wayne Co.;
Mich.—Canonie Constr. Co., South Haven, Mich., LB $1,190,336, relocation M-140 from Watervliet north to rejoin existing route near Covert, widening, concrete surf. 11.742 mi., Berrie-Van Buren Counties;
Mich.—Donald L. McDowell, Columbiaville, Mich., LB $213,522, widening, surf. 0.8 mi. M-90 thru North Branch in Lapeer Co. and 0.4 mi. similar work M-19 in Peck in Sanilac Co., Lapeer and Sanilac Counties, CD 4/15;
Mich.—Sargent Constr. Co., 12840 Bay Rd., Saginaw, Mich., LB $1,488,379, grading, drainage structures 4.6 mi. four-lane divided hy. relocated US-12 southwest of Battel Creek incl. four-span bridge to carry Climax road over expressway, Kalamazoo and Calhoun Counties; LB $372,662, 24 ft. wide concrete pavement 2.3 mi. relocated US-10 at Reed City incl. bridge over Hersey Creek, Osceola Co.;
Mich.—L. W. Edison, 3184 Midland Dr. S.E., Grand Rapids, Mich., LB $81,887, grading, drainage 0.2 mi. 36 ft. wide dual concrete pavement and curb and gutter work US-31 from Jackson St. in Grand Haven north to South Channel Bridge; LB $817,800 ½ mi. similar constr. US-31 from north end of South Channel bridge to Third St. bridge in Ferrysburg, incl. bridge over Grand Trunk Western R.R., both in Ottawa Co.;
Mich.—Cooke Contg. Co., 1116 Penobscot Bldg., Detroit, and C. J. Rogers, Inc., 14836 Grand River Ave., Detroit, Mich. (joint venture) LB $1,998,626, grading, drainage structures, dual 26 ft. wide roadways, ramps and work on utility alterations 1½ mi. section from Connor Ave. to Outer Dr., Wayne Co., CD 4/3;
Mich.—William H. Gilliland, 313 State Ave., Alpena, Mich., LB $234,038, 4 ft. base widening, 12 ft. concrete pave. wide left and right, curb and gutter and 28 ft. concrete 1.068 mi. US-23 from Thunder Bay River in Alpena north to French Rd. in Alpena Twp., Alpena Co., CD 3/26;
Mich.—Saginaw Asphalt Paving Co., 2840 Bay Rd., Saginaw, Mich., LB $313,761, widening, resurf. 8.5 mi. M-21 between Owosso and Ovid, Shiawassee Co., CD 4/18.

BUILDINGS—LB & CA

▲ Paul Bros. Constr. Co., 1203 N. Bend Rd., Cincinnati, O., Own Forces, $2,760,000, constr. one hundred fifty 1 and 1½ story, bsmnt., brick, HOMES, off Daly Rd., CINCINNATI, O. James Wald & Assocs., 2565 Galbraith, Cincinnati, O., engrs.
▲ R. A. Gall Realty Co., 4815 Pearl Rd., Cleveland 13, O., Own Forces, $3,450,000; Cherokee Trail Homes, 138-ranch HOMES, W. 130th St., MIDDLEBURGH HEIGHTS, O.
▲ MacDonald Eng. Co., 22 West Madison St., Chicago 2, Ill., CA Est. $3,000,000, 12 SILOES at cement plant, SPEED, IND. Louisville Cement Corp., 501 S. 2 St., Louisville, Ky., (Correction—Contractor and address). CD 4/9, under CA.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ Minn., Minneapolis—ENGINE BLDG., etc.—BA 6/11—Minneapolis-St. Paul Metropolitan Airports Comm., 2429 University Ave., St. Paul, Comm. No. 5604.1, general constr. engine bldg., boiler plant, water reservoir; Comm. No. 5604.5, stores and shops bldg., incl. electrical work, plumbing, heating and piping sys., temperature control work, fire protection work, ventilation and air-conditioning for Northwest Airlines' Main Base at Wold-Chamberlain Field, Hennepin Co. Plans deposit $100. Walter Butler Co., 1300 Minnesota Bldg., St. Paul, Zone 1, archt.-engr. CD 6/17/55.

HEAVY CONSTRUCTION—LB & CA

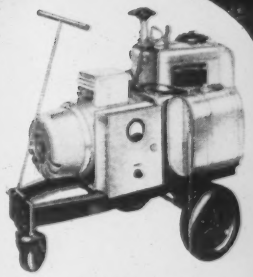
▲ TEXAS—State Hy. Comn., Austin,
Tex.—Austin Bridge Co., et al., P.O. Box 1590, Dallas, Tex. CA $2,649,100 concrete pavement, flex. base, surf. shoulders and structure widening 7.748 mi. Hy. 1H 45. Proj. 1 569 (24) and 832 (22) Dallas and Ellis Counties; CA $837,106 hydraulic embankment and structures 4.733 mi. Hy. St. 361. Proj. S 2398 (1) Nueces Co.;
Tex.—Bruce Constr. Co., Inc., P.O. Box 7421, Fort Worth, Tex. CA $1,220,442 c. conc. 0.600 mi. Hy. 1H 35W Proj. 1 473 (18) Tarrant Co.;
Tex.—Austin Road Co., P.O. Box 1590, Dallas, Tex. CA $1,938,758, c. conc. flex. base and b. conc. shoulders 7.307 mi. Hy. 1H 35E. Proj. 1 230 (8) Denton Co. Grand total $6,645,406. Bids Apr. 15, awarded Apr. 22. CD 4/21.

(Continued on page 166)

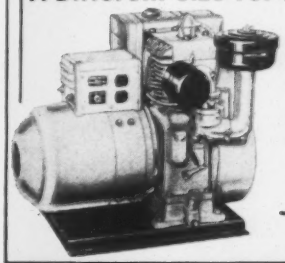
Power Plants Speed Construction

USE POWER TOOLS—FLOOD LIGHTS

•WINPOWER PORTABLE ELECTRIC PLANTS
provide a dependable, low cost power source . . . speed up work performance by operating time and labor saving power tools. Wherever the job—whatever the need—you can count on a WINPOWER Electric Plant to meet your requirements.



A Different Size For Every Need



800 WATTS To 100 KW

All Standard Phases and Voltages

These rugged, heavy-duty 3-wheel dollies are used as a permanent mounting for 3, 4, and 5 KW electric plants where portability is desired by contractors, bridge builders, mine operators, road constructors, railroads, cities and municipalities.

Trailer-Mounted Floodlight Unit

MAKE NIGHT HOURS PAY with NITE-HAWK

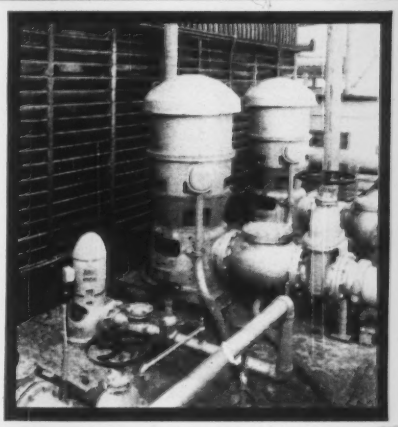
Four 80,000 c.p. flood lights raise to 8½ ft.—aim in all directions. Control panel has duplex receptacles for extension light and power tool lines—voltage regulator—circuit breakers—fused circuits.

Tows at highway speeds on heavy-duty trailer with leaf springs—retractable caster wheel. This is the finest, most flexible unit available. 5 KW, 115 or 230 Volt.

Powered by Wisconsin 4 cylinder, air-cooled engine

WRITE FOR LITERATURE AND PRICES

WINPOWER MFG. CO.
Dept. G-55 Newton, Iowa



Competitive Bids prove EFFICIENT JOHNSTONS THE BEST BUY IN VERTICAL PUMPS

Here's proof of Johnston's superiority—an evaluation of bids made recently by Johnston and five other prominent manufacturers of vertical pumps.

All size verticals: 4 to 30 inches; 1½ to 1000 hp; 25 to 10,000 gpm.

Primary water supply; sump, condenser, line and booster pumping; circulating, dewatering.

Volatile fluid handling—and many other uses

Send for complete bulletins:

Mfg.	Est. Power Cost	Over-all Efficiency	Total Cost (incl. power)
Johnston	$88,748	.7863	$108,731
Co. B	90,183	.7724	109,253
Co. C	91,883	.7585	110,460
Co. D	93,477	.7493	112,548
Co. E	93,621	.7406	112,719
Co. F	92,967	.7520	112,966

JOHNSTON PUMP COMPANY
A Division of
The Youngstown Sheet and Tube Company
PASADENA, CALIFORNIA
"The Quality Line since 1909"

Johnston Pump Co.
Bin K, Pasadena, Calif.
Send complete information on industrial applications:
Name_____
Address_____
Firm_____

Saved...$48,348 a mile...

Heavy-duty ASPHALT pavement on Interstate highway saved North Dakota an estimated $600,000■■■■■■■

■■■■ For the 12.092 mile two-lane Valley City East section of U. S. Highway #10, the State of North Dakota chose modern Asphalt paving *(12" gravel base, 5" Asphalt pavement)*.

This decision saved an estimated $48,348 *a mile* on initial costs alone, compared to bid costs on two lanes of nearby slab-paved section.

"We feel Asphalt paving is superior," said Mr. Ronald Megarry, Megarry Brothers Construction Co. "It not only costs less to lay than rigid type paving but also less to maintain."

Modern Asphalt construction has saved state after state up to 10% . . . and sometimes up to 50% . . . on paving costs alone.

with rugged ASPHALT paving!

And, in one impartial report, 7 out of 10 states said that heavy-duty Asphalt paving costs less for maintenance. On the New Hampshire Turnpike, for example, maintenance costs have been only $36.07 a mile, per year.

In winter, snow melts faster, making Asphalt pavements safer. And Asphalt paving is not harmed by de-icing chemicals. Also, heavy-duty flexible Asphalt pavement stands up in temperature extremes.

For maximum economy, comfort and road life . . . at minimum cost . . . make sure your new Interstate Highways are Asphalt-paved. *You* can bank on their permanence.

The ASPHALT Institute, *Asphalt Institute Building, College Park, Maryland*

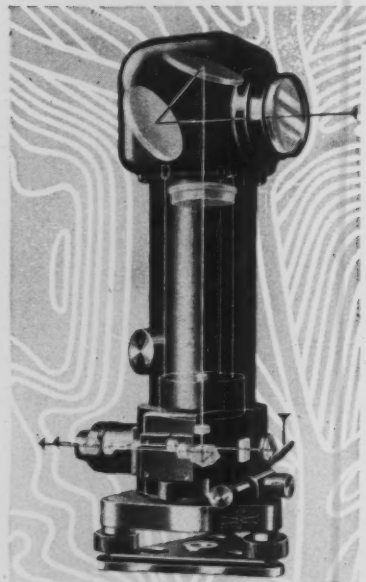
Keep Cool, mister! with ARCTIC BOY

portable water coolers

- Rugged Construction . . . good everywhere men work!
- Galvanized inset, hot dipped *after* forming for flaw-free finish!
- Large top opening, easy to ice, fill and clean.
- Send for complete information and booklet "Care and Use of Your Cooler." Write Dept. C-12.

QUALITY HEAVY METALWARE Deluxe SCHLUETER MFG. CO. ST. LOUIS, MO.

THE SCHLUETER MFG. CO. • ST. LOUIS 7, MO.



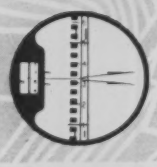
F/S PRECISE AUTOMATIC LEVEL

Model 5190

A suspended unit levels automatically the line of sight within 0.3 seconds from the true horizontal. Time is cut to ⅓, since the automatic unit operates after just roughly centering a bull's eye level and there is no sensitive vial requiring corrections for thermical variations.

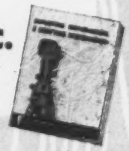
- **Periscopic Telescope, ctd. optics**
- **Erect Images, 30X magnification**
- **Built-in Micrometer to .0001 ft.**
- **Accuracy to.0013 ft. per mile**
- **Servicing by factory specialists**

F/S offers a complete line of high quality engineering instruments. Ask your nearest dealer or write today for detailed literature.



FILOTECNICA SALMOIRAGHI, INC.

41-14 24th St., L. I. C. 1, N. Y.
"DEALERS' INQUIRIES INVITED"



F/S DISTRIBUTORS: The A. Lietz Co., San Francisco and Los Angeles, Calif.—National Blue Print Co., Chicago, Ill.—Watts Instruments, Columbus, Ohio—Geo. F. Muth Co., Inc., Wash., D. C.— CANADA: Instruments 1951 Ltd., Ottawa, Toronto, Regina, Montreal.

(Continued from page 163)

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Calif., Sacramento**—BA 5/29—Sacramento Municipal Utility Dist., 2101 K St., furnishing, 68,000 kva, vertical 1 shaft, water-wheel driven, alternating current, synchronous type generators and excitation switch with appurtenant equipment and controls for Jaybird Power house, upper American River Proj., El Dorado Co. CD 1/8.

BUILDINGS—BA

▲ **Calif., Modesto**—COURTHOUSE—BA 5/28—Stanislaus County, c/o County Clerk, Courthouse, 2 story, bsmnt. Type I constr. poured in place concrete courthouse $1,500,000. Plans deposit $50. Mitchell Van Bourg, Hotel Claremont, Suite A, Berkeley, archt. H. J. Brunnier, 55 New Montgomery St., San Francisco, engr. CD 1/4/57.

▲† **Calif., Beale Air Force Base**—HOUSING—BA 6/3—Base Procurement Office, Beale Air Force Base, 570 family housing units. Plans deposit $250. Clair A. Hill & Assocs., 1525 Court St., Redding, engr. CD 9/17, under Airports.

BUILDINGS—SLC

▲ **Ore., Portland**—FREIGHT TERMINAL—Union Pacific R.R. Co., J. A. Bunjer, ch. engr., 1416 Dodge St., Omaha, Neb., soon lets contract 1000 ft. x 170 ft., Freight Station, with 150 x 160 ft. office. Albina Yards here, $2,000,000. Leo A. Daly Co., Insurance Bldg., Omaha, Neb., engr. CD 3/21.

HEAVY CONSTRUCTION—LB & CA

▲ **Davis & Butler**, Dooly Bldg., Salt Lake City, Utah. LB $6,862,850 filtration plant mouth of Little Cottonwood Canyon Water Treatment Plant, SALT LAKE CITY, UTAH. Metropolitan Water Dist., Fisher Harris, mgr., Tribune Bldg., Salt Lake City, Utah. Bids May 1. CD 4/17.

▲† **F. E. Searway**, Las Vegas, Nev. LB $2,200,000 ($10 per ton) f.o.b. point not stated; **J. G. Shotwell**, Mercer Island, Wash. LB $1,364,000 ($6.20 per ton) f.o.b. near Marysvale, Utah; **Majestic Oil & Mining Co.**, Salt Lake City, Utah, LB $3,066,800 ($13.94 per ton) f.o.b. Glen Canyon Dam site (11 bidders, three low) Colorado River Storage Proj., 220,000 tons bulk pozzolan for Glen Canyon Dam and power plant, Spec. DS 5012, ARIZONA. Bureau Reclamation, Dpt. Interior, **Denver, Federal Center, Denver, Colo.** Bids Apr. 29. CD 5/2, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,
Peter Kiewit Sons Co., 345 Kieways Ave., Arcadia, Calif. LB $3,410,310 (14 bidders) viaduct section over Los Angeles River and adjacent railroad yards 1,250 ft. long up to 60 ft. high for 6 lanes of Santa Monica Freeway, VII-L.A.-173, 4, L.A. Los Angeles Co. Bids May 1. CD 3/26.

▲† **A. Teichert & Sons, Inc.**, 1931 Stockton Blvd., Sacramento, Calif. CA $1,623,592 runway strengthening at McClellan Air Force Base, ENG-04-167-58-33, SACRAMENTO, CALIF. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids Apr. 22, awarded Apr. 25. CD 4/24, under LB.

BUILDINGS—LB & CA

▲ **Georgia-Pacific Corp.**, Coos Bay, Ore., Own Forces, $2,000,000, PLYWOOD MILL, COOS BAY, ORE.

▲ **Dinwiddie Constr. Co.**, 210 Crocker Bldg., San Francisco, Calif. LB $3,368,450 (9 bidders) 5 story bsmnt. Type I constr. COURTHOUSE, EUREKA, CALIF. Humboldt, County, c/o Clerk, 11th and H Sts., Eureka, Calif. Mitchell Van Bourg, Claremont Hotel, Berkeley, Calif., archt. H. J. Brunnier, 55 New Montgomery St., San Francisco, Calif. engr. Bids Apr. 30. CD 4/8.

▲ **Stanton-Reed Co.**, 720 S. Palm Ave., Alhambra, Calif. LB $1,482,560 (7 bidders) constr. LIFE SCIENCE GRADUATE INSTRUCTION and RESEARCH UNIT NO. 1 at University of California, LOS ANGELES, CALIF. University of California, 405 Hilgarde Ave., Los Angeles, Calif. Bids May 2. CD 4/1.

▲ **Tom E. Norcross**, 6053 Atlantic Ave., Long Beach, Calif. LB $2,414,000 (7 bidders) constr. CLASSROOM, LIBRARY, ADMINISTRATION and LABORATORY BLDGS. at Valley Jr. College, LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro, Los Angeles, Calif. Bids May 2. CD 4/9.

▲ **M. J. Brock & Sons, Inc.**, R. J. Daum Constr. Co., 2894 Rowena Ave., Los Angeles, Calif. CA $2,359,000, est. $2,165,000 4 story rein.-con. HOSPITAL, REDONDO BEACH, CALIF. South Bay Hospital Dist., 1400 Highland Ave., Manhattan Beach, Calif. Bids Mar. 12. CD 3/17, under LB.

CANADA

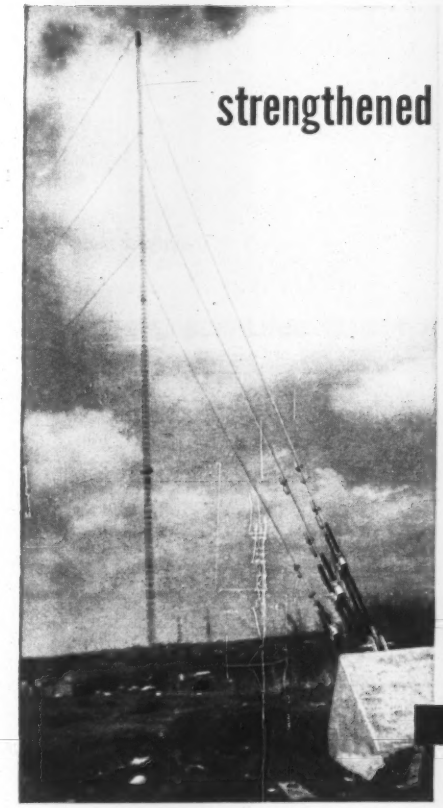
BUILDINGS—LB & CA

▲ **"Club Kingsway,"** c/o Kerim Bros. Ltd., 158 The Kingsway, Toronto, Ont. Owner Builds. $2,000,000, 4 story, 200x200 ft. rein.-con., brick, CONVENTION and DISPLAY BLDG., rein.-con. fdns. on piles, Queensway Extension between Windermere Ave. and South Kingsway, TORONTO, ONT. E. O. Ewing, 469 Eglinton Ave. W., Toronto, Ont., archt.

▲ **Rexlington Heights Ltd.**, 246 Vaughan Rd., Toronto, Ont. Owner Builds. $4,000,000, 9 APARTMENTS, 466 suites, Bergamont Rd., Islington Ave. and Rexdale Blvd., TORONTO, ONT. Uni Prii, 214 Merton St., Toronto, Ont., archt.

▲ **Duroc Constr. Inc.**, 5126 Park Ave., Montreal, Que., CA Est. approx. $2,000,000, extensive alterations and addns. to existing hospital, for DIAGNOSTIC CENTER,

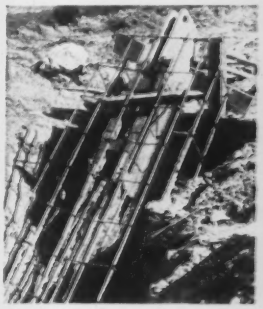
(Continued on page 168)



TV tower foundations and anchorages strengthened with LACLEDE PREFABRICATED REINFORCING

KSD-TV's new 1152-foot television antenna tower in St. Louis, Missouri, is held upright by fifteen 2" guy cables secured to six massive underground concrete blocks. Each required approximately 100 cubic yards of concrete.

Laclede reinforcing steels used in the anchors were shop weld-assembled to insure accurate fabrication, and proper distribution of the heavy design load requirements imposed upon the tower and its guys.



Specify these Laclede Reinforcing Steels for Construction:

■ multi-rib reinforcing bars ■ corrugated steel centering ■ welded wire fabric ■ electrical weld gas tubing ■ form and tie wire ■ steel pipe ■ spirals ■ conduit ■ stress relieved wire ■ 7 wire strand for prestressing

ARCHITECT: Hellmuth Obata & Kassabaum
CONSULTING ENGINEER: Wm. C. E. Becker
CONTRACTOR: E. C. Mikkelsen Construction Company, Inc.
All of St. Louis, Missouri

Delivered to the job site ready for installation, the reinforcing steel for each of the anchors was prefabricated and welded into units at Laclede's plant to insure maximum strength.

LACLEDE STEEL COMPANY

Producers of Steel for Industry and Construction
SAINT LOUIS, MISSOURI

Ferguson

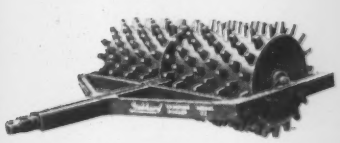
11 WHEEL, 12 TON SELF PROPELLED RUBBER TIRED ROLLER

STURDY • DEPENDABLE
POWERFUL • ECONOMICAL

Ample power, torque converter, reversomatic transmission, hydraulic steering, wide tread tires.

ROLLERS FOR EVERY PURPOSE

The Gebhard Tamper — standard the world over. Larger and smaller sizes available



WRITE FOR BROCHURE

SHOVEL SUPPLY COMPANY

4900 HINES BLVD.
P. O. BOX 1369
DALLAS, TEXAS

(Continued from page 166)

6055 St. Denis St., at University of Montreal, MONTREAL, QUE. Provincial Health Dpt., Parliament Bldgs., Quebec City, Que. CD 3/17.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲† **Interamericana de Esturdros Y Empresas S. A.,** Panama. CA $2,918,290, public roads, Panama Proj. 19, grading, etc. Puerto Esiondido to Guabala, Province of Chiriqui, PANAMA. Bureau P. Rds., Dpt. Commerce, Inter-American Hy. Program, Wash., D. C. CD 3/25, under LB.

BUILDINGS—LB & CA

▲ **Foster Wheeler Corp.,** 666 5th Ave., New York 19, N. Y., U.S.A., CA Est. $40,000,000, design and construct REFINERY, crude distillation, catalytic cracking, catalytic reforming, propane decarbonization, and treating process, steam and power plant equipment at Duque de Caxias Refinery, near RIO DE JANEIRO, BRAZIL. Petroleo Brasileiro, S. A. Govt. of Brazil, Rio De Janeiro, Brazil. CD 11/13/56.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—BA

▲† **Guam, Mariana Islands**—DORMITORY, etc.—BA 6/4—Area Public Works Officer, Marianas, P. O. Box 35, Agana, Guam, Special Weapons Training Aircraft Maintenance Shop, Aircraft Washrack, Airmen's dorm, Officers Quarters Utilities, NBy 3386, $4,000,000. CD 3/13.

BUILDINGS—LB & CA

▲† **Murray-Sanders Co.,** 2116 S. Main St., Santa Ana, Calif. LB $17,607,000, Capehart HOUSING, 1140 units, Navy Air Station, BARBERS POINT, T. H. U. S. 14th Naval Dist., Navy No. 128 Fleet Post Office, San Francisco, Calif. Benedict, Beckler & Assoc., 3501 Cahuenga, Los Angeles, Calif., and Austin & Towill, Honolulu, T. H., archts. Bids 4/8, CD 5/13.

▲† **Len Co. & Assoc.,** 8302 W. 3rd St., Los Angeles, Calif. LB $9,141,777, Capehart HOUSING, 650 units, PEARL HARBOR, T. H. U. S. 14th Naval Dist., Navy No. 128 Fleet Post Office, San Francisco, Calif. Belt, Lemmon & Lo, Honolulu, T. H. Bids 3/28. CD 9/25/51.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Kaiser Engineers, Div. of Henry J. Kaiser Co.,** 1924 Bway, Oakland, Calif., U. S. A.; **B. Perini & Sons,** Inc., 37 Montwait St., Framingham, Mass., U. S. A.; **Morrison-Knudsen Co.,** 150 E. 42 St., New York, N. Y., U. S. A. and **Raymond International Co.,** 140 Cedar St., New York, N. Y., U. S. A. CA Total $75,000,000, 3 mi. tunnel at Snowy Mountain Project, AUSTRALIA, Snowy Mountains Hydro-Electric Auth., P. O. Box 332, Cooma North New South Wales, Australia. CD 10/1, under Foreign.

Utah Constr. Co., 144 E. Broadway, Salt Lake City, Utah, U. S. A. CA concrete dam and 10 mi. diversion tunnel, (Australia);

Thiess Bros., Queensland, Australia, CA earthfill dam and 10 mi. tunnel, (Australia).

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Ill., East St. Louis**—East Side Levee & Sanitary Dist., Bd. Trustees, Dan E. Costello, pres., 2642 McCasland Ave., sanitary interceptor sewers and treatment plants, area of St Clair and Madison Counties, Illinois, to reduce pollution of Mississippi River, $17,500,000, (Hope to start construction in 1960), Horner & Shifrin, consult. engr., Shell Bldg., 1221 Locust St., St. Louis 3, Mo. will make survey. CD 2/10/50.

▲ **Kan., Mission**—Turkey Creek Sewer Dist., 6915 Johnson Dr., Mission, bond election May 27, sewerage sys. and treatment plant. $2,320,000. Black & Veatch, 1500 Meadow Lake Parkway, Kansas City 14, Mo. engrs. CD 7/3.

▲ **Minn., East Grand Forks**—City, A. G. Rand, clk., voted $890,000 bonds Apr. 9. lagoon sewage disposal sys. $1,140,000.

▲ **Neb., Omaha**—City, City Hall, Sprague St. relief sewer which will feed into interceptor at Comish Blvd. $2,500,000; interceptor sewer paralleling the Missouri River from the Mormon Bridge to Grace St. $2,454,000. CD 10/28/52.

▲ **N. J., East Brunswick** — East Brunswick Sewerage Auth., R. F. D. No. 1, Box 201 P, New Brunswick, sanitary, trunk and intercepting sewers, Proj. No. 28-P-3037, $4,800,000. Raymond P. Wilson Assocs., Paterson St., New Brunswick, consult. engrs. to go ahead by 1960, CD 8/7/47.

▲ **Ore., Portland**—City, City Hall, sewers, connections, West side Willamette River, $1,428,912; nine sewage pumping stations, east side Willamette River, $194,000; sewers, connections east side Willamette River, $272,685; seven sewage pumping stations, west side Willamette River, $225,000; Linnton sewage treatment plant, $297,000; Guilds Lake sewage treatment plant, $990,000; 2 sewage pumping stations in Columbia slough section, $70,000; sewers and connections in Columbia Slough section, $63,400. Gordon L. Burt, c/o owner, engr. CD 2/1/56.

▲ **Pa., Birdsboro**—City, City Hall, sewerage sys. $1,046,050.

▲ **Pa., Connellsville**—City, City Hall, sewage treatment plant $1,000,000. J. E. Hoenshel, c/o owner, ch. engr. CD 6/13/46.

▲ **Pa., Red Lion**—Borough, Borough Hall, sewerage sys. and treatment plant. $1,250,000.

▲ **S. D., Sioux Falls**—City, City Hall, defeated $1,250,000 bonds Apr. 15 expan. and modernization sewage disposal plant. $1,500,000. CD 2/20.

BRIDGES

▲ **OHIO**—Dpt. Hys., State Dpt. Bldg., Columbus, **Lake Co.**—Vine St. underpass, Willoughby, $3,500,000. CD 11/11/55.

STREETS AND ROADS

▲ **N. J., Newark**—City, City Hall, wid'n. Edison Pl. from Broad St. to Pennsylvania Railroad underpass $1,000,000. Edward L. Cyr, City Hall, engr. CD 12/22/43.

PUBLIC BUILDINGS

▲ **Calif., Los Angeles**—BUSINESS ADMIN. CLASSROOM—University of California at Los Angeles, 405 Hilgarde Ave., plans by Risley & Gould, 2502 W. 3 St., Los Angeles, 6 story, 168,000 sq. ft. rein. con., brick, business admin. classroom bldg., Westwood. $3,500,000.

▲ **Calif., Whittier**—SCHOOL—Lowell Jt. Unif. School Dist., 10711 S. Valley Home Ave., voted $1,250,000 bonds Mar. 11, schools.

▲ **Conn., Darien**—SCHOOL—Town, Town Hall, referendum approved Apr. 14, high school, $3,000,000. Fletcher-Thompson, Inc., 211 State St., Bridgeport, consult. engr.-archt. CD 4/2.

▲ **Mich., Ann Arbor**—SCHOOL—Bd. Educ., Ann Arbor School Dist., plans by Charles W. Lane & Assoc., 3366 Washtenaw, Ann Arbor, Junior High School. $2,500,000. CD 5/25/55.

▲ **Mich., Ferndale**—SCHOOLS—City, Bd. Educ., 130 East 9-Mile Rd., bond election May 20, schools. $1,500,000.

▲ **Mich., Greenville**—SCHOOL—Bd. Educ., Greenville P. Schools, plans by Warren S. Holmes Co., 2200 Mich. National Twr., Lansing, high school. $1,950,000. CD 4/9.

▲ **Neb., Lincoln**—YOUTH and ADULT CONFERENCE BLDG.—University of Nebraska, 12th and R Sts., plans by Selmer A. Solheim Co., archts.-consult. engrs., 1310 Sharp Bldg., youth and adult conference bldg. $2,650,000. CD 2/26.

(Continued on page 170)

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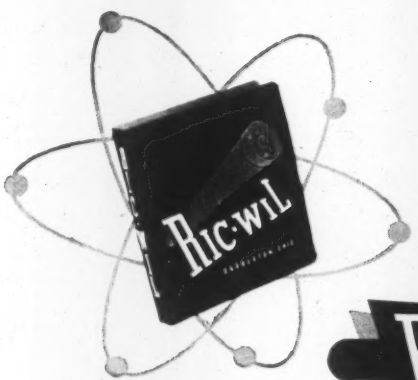

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(Continued from page 168)

▲ **N. J., Atlantic City**—CONVENTION HALL—City, City Hall, plans by Carroll-Grisdale & Van Alen, 1621 Chestnut St., Phila., Pa., convention hall imprvs. $2,000,000. Day & Zimmerman, Inc., 1700 Sanson St., Phila., Pa., consult. engr. CD 11/20.

▲ **O., Columbus**—CHEMISTRY—Ohio Dpt. P. Wks., State Dpts. Bldg., plans by Spahn & Barnes, 1950 Lee Rd., Cleveland, Zone 18, chemistry bldg. at Ohio State University. $1,000,000. Bids in July.

▲ **O., Cuyahoga Falls**—SCHOOLS—Bd. Educ., Cuyahoga Falls, bond election Nov. 4, high school addn.; three grade schools. $5,000,000. CD 2/10/55.

▲ **Pa., Athens**—SCHOOL—Athens Area Jt. School Bd., high school. $2,428,672.

▲ **Pa., Waynesboro**—SCHOOL—Waynesboro Area Jt. School Dist., Waynesboro, high school bldg. $2,000,000.

▲ **Tex., Liberty**—COLLEGE—Liberty County Jr. College Dist., Liberty Junior College, 50 acre tract. $1,000,000.

▲ **Tex., San Antonio**—SCHOOL—Harlandale Ind. School Dist., 300 W. Huff Ave., bond election May 10, high school, $1,650,000, elementary school $360,000. CD 11/11/55.

▲ **Wash., Seattle**—CONCERT HALL—City, County-City Bldg., plans by J. J. Chiarelli, 2nd and Cherry Bldg., Zone 4, and B. M. Priteca, Palomar Bldg., Zone 1, rebuilding Civic Auditorium as concert hall, $2,000,000. CD 11/9/56.

▲† **Wis., Tomah**—DINING HALL, etc.—Veterans Admin., Munitions Bldg., Wash., D. C., plans by Eschweiler & Eschweiler, 720 E. Mason St., Milwaukee, dining hall and kitchen, $1,230,000. CD 3/14/56.

COMMERCIAL BUILDINGS

▲ **Ariz., Tucson**—OFFICE—Owner, c/o Lawrence D. Mayer, 199 Stone St., plans by Nicholas Sakellar, Arizona Land Title Bldg., 4 story office needs zoning change. $4,000,000. CD 4/12/55.

▲ **Calif., San Mateo**—ELDERLY PERSONS HOMES—Presbyterian Homes, 228 McAllister, San Francisco, plans by Rolland Hammond, 530 3 St., San Refael, home for elderly persons, on 40 acre site in Portola Valley. $3,300,000. CD 3/5.

▲ **Del., Wilmington**—APARTMENT—Owner, c/o Albert Young, Equitable Security Bldg., 9th and Market Sts., plans by Alfred Polingher, 1043 Grant Ave., Phila., Pa., 13 story, 180 units, apartment, 1408 Penna Ave. $2,000,000.

▲ **Ind., Indianapolis**—SCHOOL—Trustees Butler University, Graduate Theological Seminary for School of Religion on 12 acre site at N.W. corner 42nd and Haugney Sts. adjacent to Butler campus, $10,000,000.

▲ **Kan., Arkansas City**—HOSPITAL—Arkansas City Memorial Hospital, Dr. Garland Campbell, pres. Medical Staff, plans by Ash & Harrison, 307½ Laura St., Wichita, 2 story, bsmnt., 150-bed capacity hospital addn. $1,650,000.

▲ **Ky., Lexington**—DEPARTMENT STORE, etc.—Fayette Enterprises, Inc., 1st Natl. Bank Bldg., plans by James Allen Clark Brown, Procter Hotel, Winchester, department store, restaurant, cocktail lounge, super market, drug store, drive in bank and various shops in Cardinal Valley Subdivision on Versailles Rd. Over $1,000,000. Phelps Eng. Co., 113 S. 3rd St., civil engr.

▲ **La., New Orleans**—SCIENCE, etc.—Tulane University, New Orleans, science bldg., $10,000,000; medical bldg., $6,000,000; law bldg. and dormitory, $2,000,000.

▲ **Me., Augusta**—SHOPPING CENTER—Owner, c/o Howard Millett, chn. Bldg. Dirs., Winthrop, plans by Ralph Lee Rankin, Pinecrest Ave., Pembroke, Mass., shopping center, Western Ave. $1,500,000. Bids June-July 1958. CD 8/14/56.

▲ **Md., Baltimore**—CHILDRENS MEDICAL CENTER, etc.—Johns Hopkins Hospital, Monument St. and Broadway, 10 story, brick childrens medical center for treatment, teaching and research. $11,000,000. Constr. 1959.

▲ **Mich., Southfield**—SCHOOL—Christian Brothers, John P. O'Hara, Jr., chn. Fund Campaign, Holy Name Parish, Birmingham, plans by Charles M. Valentive Assoc., 1985 Gratiot, Maryville, boys high school and monastery, Lahser Rd. north of 14-Mile Rd. $1,200,000. CD 2/24.

▲ **Mo., Kansas City**—APARTMENTS—Owner, c/o Lewis E. Kitchen, R A Long Bldg., Kansas City, Mo., plans by Kivett & Myers & McCallum, 1016 Baltimore Ave., Kansas City, Mo., six apartments: (1) 11 story, 132 units 9th and Pennsylvania, $2,000,000, West Terrace Redev. Proj. (2) 12 story, 176 units, 7th and Pennsylvania, $3,000,000, Seventh St. Redev. Proj. (3) 12 story, 176 units, 7th and Pennsylvania, $3,000,000, Washington St. Redev. Proj (4) 12 story, 176 units, 9th and Pennsylvania, $3,000,000 Clark's Point Redev. Proj. (5) 12 story, 176 units, 10th and Pennsylvania, $3,000,000, Tenth St. Redev. Proj. (6) 12 story, 176 units, 9th and Washington, $3,000,000, Ninth St. Redev. Proj.

▲ **Mo., St. Louis**—HOUSING—City & Suburban Homes Co., 130 E. 59 St., New York, N. Y., plans by Mayer, Whittlesey & Glass, 31 Union Square, New York, N. Y., and William T. Daly, 3207 Olive St., St. Louis, Zone 3, 2,100 unit housing (five 16 story; three 11 story, balance in 2 and 3 story bldgs.), Mill Creek Valley, Market St., Grand Blvd. and Garrison Ave. $2,000,000.

▲ **N. Y., New York**—ENGINEERING, etc.—New York University, Washington Sq. East, Zone 3, plans by Marcel Breuer, 201 E. 57 St., Zone 22, engineering bldg. on Bronx Campus. $3,000,000; CD 10/10/52; student dormitory on Bronx Campus, $1,500,000.

▲ **N. Y., New York**—OFFICE—Syndicate, c/o E. S. Wolfson, 24 W. 58 St., Zone 19, plans by William Lescaze, 211 E. 48 St., Zone 17, 22 story office, 30 West Broadway. $2,000,000.

▲ **O., Cincinnati**—APARTMENT—Group headed by John Deye, 2100 Patterson, plans by R. Carl Freund, 2194 Victory Pk., 12 story, swimming pool, 96-apartment bldg., Victory Pkwy. and Reading Rd. $2,500,000.

▲ **O., Cincinnati**—COUNTRY CLUB—Rolling Ridge Country Club, c/o J. Vincent Aug, Atlas Bank Bldg., constr. country club, 400-acre site, Locust Corner Rd., Amelia, in Clermont Co., near here. $1,000,000.

▲ **O., Cincinnati**—OFFICE-APARTMENT—20th Century Realty Co., Carew Tower, plans by Welton Beckett & Assoc., 5657 Wilshire Blvd., Los Angeles, Calif., 15 story, 145,000 sq. ft., office-apartment bldg., elevators, garage, Victory Parkway and Calvin Cliff. $5,000,000. Adrien Doss, Carew Tower, engr.

▲ **O., Mayfield Heights**—APARTMENT—Rosenfeld Realty Co., Citizens Bldg., Cleveland, Zone 14, 72-suite apartment project, off Hawthorne Dr. $1,000,000.

▲ **O., Ravenna**—HOUSING—D. M. Wolson & Sons, Ravenna, 88 homes Lakeview Gardens, bordered by Campbellsport and Sandy Lake Rds., $1,000,000.

▲ **O., Richmond Heights**—HOUSING—Willow-Shore Builders, Citizens Bldg., Cleveland, Zone 14, 118 homes, on new street parallel to S. Harris Rd. $2,478,000.

▲ **Ore., Portland**—CO-OP APARTMENT—Park Vista Corp., Commerce Bldg., plans by Victor Jones, 1717 SW Park Ave., Park Vista co-operative apartment. $2,440,000.

▲ **Pa., Erie**—DIAGNOSTIC, etc.—Hamot Hospital, 4 E. 2nd St., diagnostic and treatment center, $3,000,000. CD 11/10/50.

▲ **Ont., Guelph**—COLLEGE, etc.—St. Ignatius Jesuit Teachers' College, Guelph, plans by Peter Thornton of Gardiner, Thornton, Gathe & Assocs., 1520 Alberni St., Vancouver, B. C., two colleges, Woolwich St. $1,000,000.

▲ **Ont., Hamilton**—ARTS AND ADMINISTRATION—McMaster University, Dr. G. P. Gilmour, pres., Hamilton, plans by W. L. Somerville, McMurrich & Oxley, 191 Eglinton Ave. E., Toronto, arts and administration bldg. $2,968,000.

▲ **Que., Courval**—HOSPITAL—Les Freses Hospitallieres de St. Jean de Dieu, Maison Provinciale, 555 O. Blvd., Gouin, Montreal, Que., hospital for chronically ill, $1,000,000.

▲ **Que., Montreal**—CONVENT, etc.—Les Peres Dominicains, 5375 Notre Dame de Grace Ave., plans by Yves Belanger, 4481 St. Catherine St. W., 1, 2 and 3 story, rein.-con. frame, stone walls, convent and students' centre, on Cote St. Catherine Rd. $1,500,000. Lalonde & Valois, 615 Belmont St., consult. engrs.

▲ **Que., Montreal**—OFFICE—Yale Enterprises Ltd., 1231 St. Catherine St. W., 10 story office bldg., corner of Sherbrooke and Drummond Sts., $1,500,000.

INDUSTRIAL BUILDINGS

▲ **Conn., New Milford**—PLANT—Kimberly-Clark Paper Co., 128 N. Commercial St., Neenah, Wis., plans by Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y., paper plant addn., Pickett Rd. $3,000,000.

▲ **Conn., New Haven**—SHIP TERMINAL AND IMPRVS.—Conn.-Atlantic Corp., 48 Kildeer Rd., Hamden, plans by Lester J. A. Julianelle, 241 Orange St., ship terminal, Waterfront St., $5,000,000; fabricated steel, aluminum, storage bldg., ship terminal, Waterfront St., $100,000; storage and office bldg., ship terminal, Waterfront St., $350,000.

▲ **Ind., Indianapolis**—FACTORY—Fairmount Glass Works, 1301 S. Keystone St., factory addn., incl. 3 bldgs. to house production area consisting of 4 automatic bottle-making machines, an annealing oven room, 2 story packing and selection room, warehouse facilities, and installation 2 addnl. bottle-making machines, etc. $3,000,000. Toledo Eng. Co., 3001 Sylvania Ave., Toledo, O., consult. engr. CD 10/31/46.

▲ **Mo., Springfield**—PLANT—Royal-McBee Corp., Westchester Ave., Port Chester, N. Y., 30,000 sq. ft. plant for production of portable typewriters. $3,000,000. CD 10/24.

▲ **Tex., Sherman**—PLANT, etc.—Hardwicke-Etter Co., manufacturing plant and warehousing (mfg. cotton ginning equipment and earth moving machinery, etc.), 72.9 acre site. $1,000,000.

UNCLASSIFIED

▲ **N. Y., Wantagh**—BEACH PARK, etc.—Town Bd., Town Hall, Hempstead, 200 acre beach park, incl. playground, swimming pool, ball fields, pitch-putt golf course, bathhouse, tennis courts, picnic areas, parking lot for 2,000 cars and eventually, a marina. $2,000,000.

▲ **Wash., Seattle**—SITE IMPRVS.—City, County-City Bldg., Zone 4, site imprvs. for world's fair. $5,750,000. Scheduled to begin in 1961. P. D. Kirk, 615 Lakeview Blvd., Seattle, consult. engr. CD 12/30.

▲ **Que., Montreal**—PARK IMPRVS.—City, City Hall, plans by Landscape Archts. Clarke & Rapuano, 145 E. 32nd St., New York, N. Y., hockey and roller skating rink, Maissonneuve Park. $2,000,000. CD 6/23/53.

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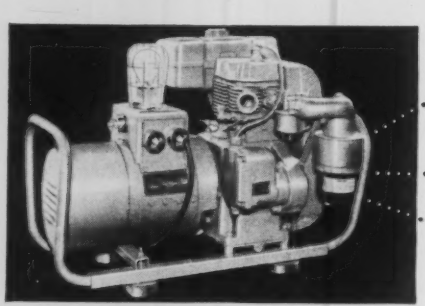

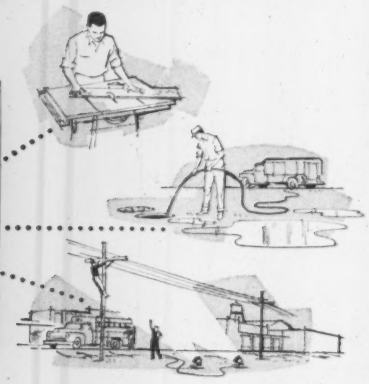

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NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 20 Massachusetts

BUILDINGS—BA

▲† **Mass., Falmouth**—HOUSING—BA 5/27—U. S. Eng., 150 Causeway St., Boston, 488 units family housing at Otis Air Force Base, ENG-19-016-58-157. $7,000,000-$8,000,000. Plans deposit $50. Charles A. Maguire & Assoc., Turks Head Bldg., Providence, R. I., archts. CD 4/24.

HEAVY CONSTRUCTION—LB & CA

▲† **John A. Volpe Constr. Co.**, 54 Eastern Ave., Malden, Mass., CA $8,687,249, est. $11,652,254, BOMARC Missile Launching Facility (FY-58) 5 mi. from Dow Air Force Base, ENG-19-016-58-126, BANGOR, ME. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 29. CD 5/1, under LB.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Campanella & Cardi Constr. Co., 780 Jefferson Blvd., Warwick, R. I., CA $4,219,044, est. $4,894,961, hy. and bridge constr. Rte. 28, I-350(11), Wilmington. Bids Apr. 15. CD 4/17, under LB.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,

Mariani Constr. Co., 222 Forbes Ave., New Haven, Conn., CA $3,875,648, est. $4,700,000, Proj. 92-93, grading, drainage incl. railroad bridge, over New York, New Haven & Hartford R.R. and three separation structures on relocation of Route No. 34, New Haven Co. Bids Apr. 10. CD 5/6/58, under LB.

BUILDINGS—LB & CA

▲† **Franchi Constr. Co., Inc.**, 216 Webster St., West Newton, Mass., LB $1,529,000, MEDICAL and PHYSICAL REHABILITATION BLDG., at Veterans Hospital, BEDFORD, MASS. Veterans Admin., Munitions Bldg., Wash., D. C. Bids May 6. CD 3/25.

▲ **White Constr. Co.**, 376 Boylston St., Boston, Mass. LB $1,734,800, est. $1,830,000, JUNIOR HIGH SCHOOL, off Burlington and Adams St., LEXINGTON, MASS. Town, Supt. Schools, 1475 Massachusetts Ave., Lexington, Mass. Bids May 2. CD 4/18.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 27 New Jersey

STREETS AND ROADS

May 27 New Jersey

▲† **N. Y., New York**—TUNNEL—BA 6/6—U. S. Post Office, c/o Business Service Center, Ground Floor, 250 Hudson St., Zone 13, Ninth Ave. Tunnel. CD 8/30.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., The Gov. Alfred E. Smith, State Office Bldg., Albany, Bids opened 5/1,

Terry Contrg. Inc., 31 E. 27 St., New York 16, N. Y., LB $1,967,863. Est. $2,160,000. (4 bidders), superstructure and approach work for bridge to carry Empire Stateway over Oneida Lake, east of Brewerton, Oswego Co. CD 4/11.

▲ **Merritt-Chapman & Scott Corp.**, 260 Madison Ave., New York, N. Y., LB $65,962,254 (4 bidders) Contr. N-5, constr. waterways work, Section No. 1 and appurtenant works, Niagara Power Plant in Niagara Falls, Spec. PA-N-23005, NEW YORK. Power Auth. of State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, N. Y. Bids May 6. CD 3/24.

▲ **PENNSYLVANIA**—Pa. Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,

Pa.—**W. P. Dickerson & Son**, 316 Hart St., Hollidaysburg, Pa. CA $1,516,966. Sched. 1: 12 span 0.37 mi. concrete deck plate girder bridge over Juniata River, Penn., Reed & Watts Twps., Duncannon Boro, Perry and Dauphin Counties;

Pa.—**C. J. Langenfelder & Sons, Inc.**, 8427 Pulaski Ave., Baltimore, Md. CA $5,096,942. Sched. II 5.25 mi. divided hy. c. conc. 24 ft. wide each side medial area 6 bridges (1: proj. 716-1) (2; Proj. 717-1) Penn, Reed and Watts Twps., Duncannon Boro, Perry and Dauphin Counties. Bids Apr. 11, awarded May 2. CD 4/16 under LB.

▲† **Booth & Flinn Co.**, 1942 Forbes, Pittsburgh 19, Pa. CA $3,038,376, Stillwater Dam and appurtenant work consisting of cofferdams and river diversion excavation and embankment for knolled fill earth dam, 77 ft. high, 1,700 ft. long, slope protection and drainage, concrete spillway near Forest City, ENG-18-020-58-9, PENNSYLVANIA. U. S. Eng., 24th St. and Maryland Ave., Baltimore 18, Md. Bids Apr. 16. CD 4/18, under LB.

▲† **Bureau P. Rds., Dpt. Commerce**, 1440 Columbia Pike, Arlington, Va., received no bids May 6, Contr. 1, Woodrow Wilson Memorial Bridge, underwater excav. at embankment site to cross Potomac River, 1 mi. south of D.C. line to Alexandria, Va., Forest Heights, Md., MARYLAND and VIRGINIA. CD 4/17.

BUILDINGS—LB & CA

▲ **Diesel Constr. C.**, 24 W. 48th St., New York, N.Y., CA Est. $100,000,000, 50 story, 3,000,000 sq. ft. "Grand Central City" COMMERCIAL OFFICE BLDG. incl. 2,000 car parking garage, 3 theatres, exhibition area, open-air restaurant, adjacent to Grand Central Terminal, NEW YORK, N.Y. Group, c/o Erwin S. Wolfson, chn. Bd., Diesel Constr Co., 24 W. 48 St. and Herbert & Stuart Scheftel and Alfred G. Burger, 4 W. 48th St., New York, N. Y. Emery Roth & Sons, 575 Madison Ave., New York, N.Y., archts.

▲ **Raisler Corp.**, 129 Amsterdam Ave., New York 23, N. Y., LB $1,796,000 (9 bidders), Contr. 4, heating and ventilating for City and Municipal COURTS BLDG., Centre and White Sts., Manhattan Boro, NEW YORK, N. Y. City, Dpt. P. Wks., Municipal Bldg., New York, Zone 7, N. Y. Bids May 1. CD 4/24.

▲† **Tufano Contg. Corp. and Anthony Grace & Sons, Inc.**, 32-17 Lawrence St., Flushing, N. Y., CA $3,440,734. 220 Capehart HOUSING UNITS, Suffolk County Air Force Base, WEST HAMPTON BEACH, N. Y. Dpt. Defense, Air Force, 3800 Neward St. N.W., Wash., D. C. Bids Apr. 15. CD 3/25.

▲ **Constr. Techniques (Maurice Amosso & Howard Dietsch)**, 18 Belleville Court, Belleville, N. J., Own Forces, $7,000,000, 350 HOMES, Valley View Rd., Bridgewater Twp., BOUND BROOK, N. J. Morton S. Lipschultz, Park Ridge, N. J., engr. C. J. Kordys, 462 Meer Ave., Wyckoff, N. J., archt.

▲ **Paul Rochelle, Jr.**, Sussex Ave., Morristown, N. J., Own Forces, $1,200,000, 50 HOUSES, off Sussex Turnpike, MOUNT FREEDOM, N. J. William Thun, North Maple Ave., Basking Ridge, N. J., archt.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 21 Virginia

STREETS AND ROADS

May 21 Virginia

HEAVY CONSTRUCTION—LB & CA

▲ **KENTUCKY**—State Hy. Dpt., State Hy. Comn., Frankfort,

Tye & Wells, Eminence, Ky. and **Perrin Constr. Co.**, Cynthiana, Ky., CA $1,215,623, b. conc. 11,626 mi. Owensboro-Whitesville (Ky. 54) Rd. from approx. 0.7 mi. east of east corporate limit of Owensboro, extending easterly to point approx. 0.2 mi. west of west limits of Whitesville, SP 30-57-S 206(1), Daviess Co. Bids Apr. 18. CD 4/28, under LB.

▲† **Anderson Gregory**, Sudekum Bldg., Nashville, Tenn. **Burns Contg Co.**, 16th Ave., S., Nashville Tenn., **Wallace Constr. Co.**, Elizabethtown, Ky. LB $3,126,705 (joint bid) 10,000 ft. jet runway at Berry Field built to airforce specifications 8,000 ft. with 1,000 ft. of overrun at each end, NASHVILLE, TENN. City of Nashville and National Guard Bureau, Andrews Air Force Base, Camp Springs, Md. Donald F. Steinbaugh, 3 National Bank Bldg., Nashville, Tenn. archt. Consoer, Townsend & Assocs., 360 E. Grand St., Chicago, Ill. engrs. Bids Apr. 28.

BUILDINGS—LB & CA

▲ **Abe Pollin**, 6101 16th St. N.W., Wash., D. C. Owner Builds. $2,500,000, 200 unit APARTMENT, Arlington Ridge Rd., ARLINGTON, VA. Berla & Abel, 2000 P St. N.W., Wash., D. C. archts.

▲† **J. Kennon Perrin**, 5th and Cary Sts., Richmond, Va. LB $1,344,299 (5 bidders) two 3 story masonry block barracks, enlisted men two company ENG-44-110-58-29, FORT LEE, VA. U. S. Eng., foot of Front St., Norfolk 1, Va. Bids about May 7. CD 4/15.

▲ **Ball Constr. Co.**, 2010 NE 120 Rd., North Miami, Fla., CA Approx. $1,400,000, 36 RESIDENCES, with swimming pool, NE 119 Rd., NORTH MIAMI, FLA. San Souci Estates, 11805 Biscayne Blvd., North Miami, Fla.

▲ **Keller Constr. Co.**, Box 439, New Orleans, La., LB $1,317,000, (7 bidders) 51,000 sq. ft. brick, limestone, concrete block CHURCH and EDUCATIONAL BLDG., NEW ORLEANS, LA. First Methodist Church, 4140 Canal St., New Orleans, La. Bids Apr. 29. CD 4/10.

▲ **Whittenburg Constr. Co.** 2214 S. Floyd St., Louisville, Ky., LB $3,951,400. general contract incl. mechanical bids, Methodist Evangelical HOSPITAL, Louisville Medical Center, LOUISVILLE, KY. Methodist-Evangelical Hospital Bd., c/o Nevin Morgan, archt., Starks Bldg., Louisville, Ky. Bids May 7. CD 4/10.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† **Illinois**—BA 6/17—U. S. Eng., Merchandise Mart, Chicago, Zone 54, Ill., channel imprvs. at Acme bend, Little Calumet River, involving 1,200,000 cu. yd. channel widening consisting common excav. 18,400 cu. yd. of dumped riprap and concrete retaining wall, CIVENG-11-032-58-1. $4,500,000.

BUILDINGS—BA

▲ **Mich., Grand Rapids** — PLANT — BA 5/23 — Bissell Carpet Sweeper Co., 210 Erie N.W., plant, Walker Rd. N.W. $3,000,000. J. & G. Daverman Co., 924 Grandville, archt. CD 2/3.

▲ **O., Columbus**—ARTS AND SCIENCES—BA 6/3—Ohio Dpt. P. Wks., State Dpts. Bldg., Denny Hall, Arts and Sciences, for Ohio State College. $1,990,000. Plans deposit $50. Hays & Ruth, 1720 Euclid Ave., Cleveland, Zone 15, archts. CD 4/18.

BUILDINGS—SLC

▲ **Ill., Barrington**—WAREHOUSE—Jewel Tea Co., 1208 Hough, soon lets contract, 1 story, 135,000 sq. ft. warehouse. $1,500,000. A. Epstein & Sons, Inc., 2011 W. Pershing Rd., Chicago, Ill., archt.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Bids opened Apr. 29,

O.—**Hinton Constr. Co.**, 638 N. Main St., Celina, O. LB $368,939, est. $394,200 (4 bidders) Type T-35, 4.668 mi., USR 305 (8.54-13), 17 (City of Lima), Village of Elida, Allen Co.;

O.—**The Clinton Asphalt Paving Co.**, 805 E. Columbus St., Wilmington, O., LB $324,500, est. $340,800, Type 35 and structures, 5.943 mi. USR 35-3, 31, F-605 (12), Fayette Co.;

O.—**Philip Skinner**, Route No. 1, Bethesda, O., LB $292,336, est. $379,400 (9 bidders) type T-35 on B-119, 0.819 mi. SR 213-0.04, S-1118 (3), Jefferson Co.;

O.—**Peter Kiewit Sons' Co. & Condon-Cunningham, Inc.**, 15806 Lorain Ave., Cleveland, O., LB $4,595,159, est. $4,660,600 (6 bidders) Type T-71 and structures, 5.518 mi, SR 1-8.54 AC1-1105 (18) Richland Co.;

O.—**Soda & Luscher Constr. Co.**, Niles, O., LB $770,610, est. $806,800 (3 bidders) Type T-35 and structures, 5.412 mi., SR 45-(15.88-18.59) F-155 (2), Trumbull Co. CD 4/9.

▲ **Emil Marcelletti & Son**, 25 W. Monroe St., Bedford, O., LB $1,222,900, est. $1,400,000 (7 bidders' Contr. 1-E, Lake Shore Blvd. Trunk Sewer, entire section, E. 185th-E. 232nd St., EUCLID, O. City, City Hall, 585 E. 222nd St., Cleveland 23, O. Bids Apr. 28. CD 4/15.

▲ **Haddad Constr. Co.**, 568 Wilson Ave., Columbus, O., LB $1,216,484, Contract 28, Section 1, low level interceptor sewer line, MANSFIELD, O. City, City Hall, Mansfield, O. Bids Apr. 17. CD 4/9.

Claude Plumbing Co., Amherst, O., LB $765,909, Contr. 28, Section 2, low level interceptor sewer, (Mansfield, O.).

▲ **INDIANA**—John Peters, chn. State Hy. Comn., State House Annex, Indianapolis, Zone 4, Bids opened 4/29,

Ind.—**J. S. Sweet Co., Inc.**, Cambridge City, Ind., LB $167,781, est. $194,359 (9 bidders), Contr. 4376; LB $165,312, est. $189,189 (10 bidders), Contr. 4377; LB 239,386, est. $274,763 (11 bidders) Contr. 4378, Shelby Co.;

Ind.—**Ruby Constr. Co., Inc.**, Madisonville, Ky., LB $253,833, est. $283,918 (8 bidders), Contr. 4380, Shelby Co.; LB $221,257, est. $255,290 (6 bidders), Contr. 4372, Clark Co.;

Ind.—**Meshberger Stone Co.**, Columbus, Ind., LB $203,387, est. $219,143 (6 bidders), Contr. 4379, Shelby Co.;

Ind.—**Traylor Bros., Inc.**, Upper Mount Vernon Rd., Evansville, Ind., LB $1,535,301, est. $1,726,346, (9 bidders), Contr. 4374, Vermillion and Fountain Counties;

Ind.—**Dyer Constr. Co.**, 1716 Sheffield St., Dyer, Ind., LB $587,283, est. $750,966 (4 bidders), Contr. 4389, Lake Co.;

Ind.—**J. C. O'Connor & Sons, Inc.**, 2104 Miner St., Fort Wayne, Ind., LB $402,796, est. $498,673 (4 bidders), Contr. 4390, Lake Co. CD 4/15.

▲ **INDIANA**—State Hy. Dpt., John Peters, chn., State House Annex, Indianapolis, Bids opened 4/29,

Ind.—**Brooks Constr. Co.**, 1123 Barthold St., Fort Wayne, Ind., LB $80,672, est. $82,738, (3 bidders), bit. base widn., and resurf. and bit. resurf., Contr. RS-4362, F-98(26) ST-377 E, Allen Co.; LB $257,199, est. $274,186, (4 bidders), bit. base widn. and resurf., Contr. RS-4393, F-239(4), Grant and Blackford Counties;

Ind.—**Mohr Constr. Co.**, 1420 S. Union St., Kokomo, Ind., LB $189,961, est. $196,842, (2 bidders), bit. pavement, Contr. R-4398, R-RD-4(2), Cass and Miami Counties; LB $162,771, est. $169,742, (2 bidders), bit. resurf. bit. base widn., Contr. RS-4395, F-284 (12), Miami and Grant Counties;

Ind.—**Calumet Paving Co.**, Zionsville, Ind., LB $1,711,880, est. $1,902,251, (5 bidders), rein.-conc. pavement, Contr. R-4405 F-616(6), Union and Wayne Counties; LB $2,949,135, est. $3,521,083, (7 bidders), Contr. R-4399 I-0503(18), Shelby Co.;

Ind.—**Dyer Constr. Co.**, 1716 Sheffield St., Dyer, Ind., LB $493,156, est. $563,254, (4 bidders), bit. pavement with agg. base, Contr. R-4400 S-17(3), LaPorte Co.;

Ind.—**J. C. O'Connor & Sons**, 2014 Miner St., Fort Wayne, Ind., LB $2,370,470, est. $2,497,944, (3 bidders), c. conc. pavement and rein.-con. girder structure, Contr. R-4401 F-77(22), LaPorte and Starke Counties;

Ind.—**Muncie Paving & John McDonald**, Muncie, Ind., LB $224,774, est. $232,668, (1 bidder), bit. pavement with Macadam Base, Contr. R-4402 S-119(4), Henry Co.;

Ind.—**A. T. Gravelie**, 3815 Massachusetts Ave., Indianapolis, Ind., LB $326,629, est. $349,516, (3 bidders), bit. pavement with agg. base, Contr. R-4404 S-344(2), Marion Co.;

Ind.—**Rieth-Riley Constr.** Goshen, Ind., LB $2,090,052 est. $2,317,799, (7 bidders), c. conc. pavement, Contr. R4397 S-36(2) I-0302(5), Jackson Co.;

Ind.—Pheid & Brown Inc., Milford, Ind., LB $484,306, est. $487,314, (1 bidder), bit. pavement with concrete base, Contr. RS-4363 F-158(2), Jasper Co.;

Ind.—Ralph Rogers & Co., S. Adams St., Bloomington, Ind., LB $270,869, est. $334,647 (4 bidders), bit. pavement with concrete base, Contr. RS-4391 F-16 (31), Orange Co., CD 4/16.

BUILDINGS—LB & CA

▲ Joseph M. Brickman, 7830 W. Lawson Moridge, Chicago, Ill., CA $2,259,000, general contract 314 low-rental HOUSING PROJECT S-6, DAYTON, O. Dayton Metropolitan Housing Auth., 1201 Brennan Dr., Dayton, O. Bids Mar. 11, CD 3/18, under LB.

▲ Son Development Co., c/o Elmer J. Son, pres., 7825 N. Dixie Dr., Dayton, O., Owner Builds. $2,500,000, 217 HOMES, S. W. corner of State Route 48 and Alexandersville-Bellbrook Rd., Washington Twp., DAYTON, O.

▲ Coath & Goss, Inc., 5103 W. Lake St., Chicago, Ill., CA $1,239,041, 2 story, brick, stone, HIGH SCHOOL addn., East Ave. and Ontario St., OAK PARK, ILL. School Dist. 200, East Ave. and Ontario St., Oak Park, Ill. CD 4/17, under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

May 23 Minnesota, North Dakota

STREETS AND ROADS

May 23 Minnesota, North Dakota

▲† New Mexico and Colorado—BA 6/19—Office of Chief Engineer, Bureau Reclamation, Denver, Colo., constr. of Navajo Dam 405 ft. high, 3,600 ft. long in north-central New Mexico, 34 mi. northeast of Farmington on the San Juan River, Rio Arriba Co. CD 9/13.

BUILDINGS—BA

▲† Colo., Fort Carson—CAMP UTILITIES—BA 5/28—U. S. Eng., 1709 Jackson St., Omaha, Neb., utilities imprvs., extensions, ENG-25-066-58-112, Fort Carson, $1,665,000. CD 9/17.

▲† Tex., El Paso—HOUSING—BA 5/28—U. S. Eng., Box 1538, Albuquerque, N. M., 125 "Capehart" Housing units William Beaumont General Hospital, ENG-29-005-58-92. $1,875,000. CD 4/23.

▲† Tex., Waco—HOUSING—BA About 5/29—Navigator Training Wing, U. S. Air Force, c/o Contg. Officer, Connally Air Force Base, Waco, 366 family housing units, Connally Air Force Base, Inv. 41-611-58-51. $4,026,000. Plans deposit $200. CD 1/24.

HEAVY CONSTRUCTION—LB & CA

▲ MISSOURI—State Hy. Comn., Jefferson City, Bids opened 4/25.

Mo.—S. J. Groves & Sons Co., Box 1059, Springfield, Mo., LB $245,777 (7 bidders), 1-78 ft., 2-54 ft. I-beam spans, Franklin Co.;

Mo.—Mary Constr. Co., Inc., P. O. Box 423, Cape Girardeau, Mo., LB $887,431, (8 bidders), floor and rail on 0.493 mi. viaduct., St. Louis Co. CD 4/8.

▲ MISSOURI—State Hy. Comn., Jefferson City, Bids opened 4/25.

Mo.—Porter DeWitt Constr. Co., Hannibal Constr. Co. and Illinois Valley Constr. Co., P. O. Box 279, Poplar Bluff, Mo., LB $3,212,064 (7 bidders), 24 ft. c. conc. pavement 6.884 mi. Franklin Co.;

Mo.—Cameron-Joyce & Co., 19 S. 7th St., Keokuk, Iowa, LB $615,236, (9 bidders) graded earth 4.096 mi. Platte Co. CD 4/8.

▲† Martin K. Eby, 610 N. Main St., Wichita, Kan. CA $1,233,113, est. $1,388,150, Schedule I, constr. structural steel frame hangar, 2 story frame leantos, brick annex bldg. with attached boiler, Air National Guard, Rosecrans Field, ENG-23-028-58-30, ST. JOSEPH, MO. U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. Bids Mar. 18. CD 3/24, under LB.

▲† Peter Kiewit Sons Co., 1024 Omaha National Bank Bldg., Omaha, Neb. LB $5,847,307, est. $5,965,611 Job No. Blytheville AFB-ACRP-AF Item No. 88-001 (111-117) runway primary instrument and Item No. 88-002 (113-324) apron operational, Blytheville Air Force Base, ENG-03-050-58-40, BLYTHEVILLE, ARK. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids May 7. CD 4/14.

▲ J. A. Tobin Constr. Co., 3701 Rainbow, Kansas City, Kan. LB $2,350,657, est. $2,364,483, paving 18th St. Expressway and constr. interchange with Johnson Dr. and ramp connections US-50, KANSAS CITY, KAN. Kansas Turnpike Authority, RFD 9, Topeka, Kan. Bids May 2. CD 9/30/54;
Evans Electrical Constr. Co., 1621 Locust, Kansas City, Mo. LB $217,815, est. $222,290, lighting entire 18th St. Expressway, (Kansas City, Kan.)

▲ TEXAS—State Hy. Comn., Austin,
Dean Word Co., P. O. Box 330, New Braunfels, Tex. CA $1,220,441 grading, structures, flex. base and hot mix b. conc. 3.54 mi. Hy. IH 35, Proj. I 140 (17) Williamson and Travis Counties. Bids Apr. 16, awarded May 1. CD 4/21, under LB.

▲† Cain & Cain, 4001 S. Expressway, Fort Worth, Tex. CA $1,464,142 est. $1,395,000, hangar, and office bldg. for Central Airlines at Carter Airport, FORT WORTH, TEX. City, c/o Thos. A. McCann, mayor, Fort Worth, Tex. Bids Apr. 22, awarded May 2. CD 4/24, under LB.

BUILDINGS—LB & CA

▲ Austin Co., 16112 Euclid, Cleveland, O., CA Est. $2,000,000 design and construct WAREHOUSE, at St. John and Belmont, incl. two 2 story warehouse type structures with loading dock for 24 rail cars and 48 trucks, connected to existing store, KANSAS, CITY, MO. Montgomery Ward & Co., St. John and Belmont Ave., Kansas City, Mo.

▲† Kingery Constr. Co., 1941 Y St., Lincoln, Neb. CA $1,965,615 combination ELEMENTARY and HIGH SCHOOL and HOSPITAL, Cheyenne Agency relocation, for Oahe Dam, ENG-25-066-58-89, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Apr. 22. CD 5/2, under LB.

▲ Homer A. Parks Constr. Co., 1225 Exchange Bank Bldg., Dallas, Tex. CA Est. $2,500,000, 3 SHOPS "A, B, C" DALLAS, TEX. Exchange Park Co., 1200 Exchange Bank Bldg., Dallas, Tex. Lane, Gamble & Assocs., 2520 Mockingbird Lane, Dallas, Tex., archts. CD 7/13/55.

▲ Homecraft Builders, 2116 Military Dr., N.W., San Antonio, Tex. LB $1,896,500 Base Bid, 208 DWELLING UNITS in 87 separate bldgs., Proj. Tex. 6-15, SAN ANTONIO, TEX. San Antonio Housing Auth., Marie McGuire, 400 Labor St., San Antonio, Tex. Bids Apr. 29. CD 4/10.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

May 23 Arizona June 4, 12 California

▲† Calif., Beale Air Force Base—COMPOSITE STRUCTURE—BA 5/28—U. S. Eng., 1209 8th St., Sacramento, 91,000 sq. ft. floor space with utilities, composite structure, Spec. 2421, ENG-04-167-58-49. $1,720,000. CD 9/17.

▲† California—BA 6/18—U. S. Eng., 1209 8th St., Sacramento, Sacramento River Deep Water Ship Channel Proj., barge canal lock, bascule bridge and power, control and lighting sys., Yolo Co., Spec. No. 1455, ENG-04-167-58-40. $6,635,000. Extended date. CD 4/7.

▲ Calif., Los Angeles—BA 6/6—Los Angeles Co. Flood Control Dist., 2250 Alcazar St., covered concrete conduit for Sycamore-Scholl Diversion from Chevy Chase Dr. to Verdugo Rd. $3,000,000. CD 7/19.

BUILDINGS—BA

▲ Calif., Huntington Beach—SCHOOL—BA 6/4—Huntington Beach Union High School Dist., 1905 Main St., high school plant in Westminster area. $3,400,000. CD 10/22/56.

▲† Calif., Oxnard—HOUSING—BA 6/4—Procurement Office, Oxnard Air Force Base, 315 unit Armed Services Housing Proj. $4,500,000. CD 4/18/56.

HEAVY CONSTRUCTION—LB & CA

▲ Metropolitan Water Dist. of Southern California, 306 W. 3 St., Los Angeles Calif. rejected bids Apr. 3 constr. 5 siphons along the Colorado River Aqueduct between San Jacinto and Val Verde Tunnel in Riverside CO 13 ft. diam. pipe approx. 7 mi. in length, LOS ANGELES CALIF. LB $6,157,540. CD 4/8, under LB.

▲ Valley Engineers, Inc., P.O. Box 746, Fresno, Calif. LB $1,350,555 constr. Granada Trunk line Unit III water mains, LOS ANGELES, CALIF. Los Angeles Dpt. Water & Power, 311 S. Spring St., Los Angeles, Calif. Bids May 6 CD 4/7.

BUILDINGS—LB & CA

▲ T. G. K. Constr. Co., (1st unit) 2750 W. McDowell Rd., Phoenix, Ariz., CA Est. $3,000,000, 2 story, brick, 104,000 sq. ft. permanent PLANT BUILDING, PHOENIX, ARIZ. General Electric Co., Computer Dpt., 840 S. Canal St., Chicago, Ill. CD 3/21.

▲ Johnson-Busboom-Bauh, 601 N. Cedar St., Spokane, Wash., CA $1,900,469, (4 bidders), general contract, 4 story, 85 x 423 ft. and 2 story, 54 x 144 ft. rein-con. PLANT SCIENCES BLDG., PULLMAN, WASH., Washington State College, Pullman, Wash., Bids Apr. 25. CD 4/30, under LB.
Warren, Little & Lund, 120 W. 2 St., Spokane, Wash., CA $1,223,025, (3 bidders), mechanical contract, (Pullman, Wash.).

▲ Hoffman Constr. Co., 715 S. W. Columbia St., Portland, Ore., CA $2,000,000, PLYWOOD MILL, COOS BAY, ORE. Georgia-Pacific Corp., Coos Bay, Ore. (correction-contractor.) CD 5/6, under CA.

▲ Hoffman Constr. Co., 715 S. W. Columbia St., Portland, Ore., CA $1,844,000 (8 bidders) 200-room Benson HOTEL addn., PORTLAND, ORE. Western Hotels, Inc., Olympic Hotel, Seattle, Wash. Victor N. Jones, 1717 SW Park Ave., Portland, Ore. archt. Bids Apr. 30. CD 4/9.

▲† Dale Benz, J. W. Wells, B. W. Otis, 1912 W. Grant St., Phoenix, Ariz. CA $5,634,596, est. $1,000,000 constr. CENTRAL REPAIR SHOP, Marine Corps Supply Center, Spec. 10046-57, BARSTOWN, CALIF. Eleventh Naval Dist., 1220 Pacific Hy., San Diego, Calif. Bids Apr. 17 CD 4/22, under LB.

▲ Arthur Pinner Jr., 9510 S. Main St., Los Angeles, Calif. LB $2,134,000 (6 bidders) constr. Lawndale HIGH SCHOOL, Inglwood Ave. near Compton Blvd., HAWTHORNE, CALIF. Centinella Valley Union High School Dist., 365 Hawthorne Way, Hawthorne, Calif. Bids May 7. CD 4/21.

▲† Swinerton & Walberg, 1723 Webster St., Oakland Calif. LB $2,178,000 (17 bidders) AEC BLDG. 170, 55,000 sq. ft. 2 story OFFICE BLDG., 51,000 sq. ft. LAB and SHOPS BLDG., LIVERMORE, CALIF. Atomic Energy Comn., c/o Dir. Eng. Div., San Francisco Operation Office, 518-12th St., Oakland, Calif.

▲ Boespflug Constr. Co., 605 S. Lucas, Los Angeles, Calif. LB $6,320,000 (4 bidders) constr. Long Beach Memorial HOSPITAL, LONG BEACH, CALIF. City City Hall, Long Beach, Calif. Bids May 7. CD 3/24

▲ Gust K. Newburg Constr. Co., Box 791, Terminal Annex, Los Angeles, Calif. CA $20,467,000 8 story HALL OF ADMINISTRATION BLDG., LOS ANGELES, CALIF. Los Angeles Co. Bd. Retirement, Los Angeles Co. Hall of Records, Los Angeles, Calif. Bids Apr. 2, awarded May 6. CD 4/4, under LB.

▲ Corry & Longworth, Inc., Box 368, San Diego, Calif. LB $1,940,000 (6 bidders) constr. five 3 story, rein.-con., brick RESIDENCE HALLS at San Diego State College SAN DIEGO, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids May 7, CD 4/8.
E. O. May Co., Inc., 2014 East Colorado St., Pasadena, Calif. LB $499,000 (7 bidders) plumbing and heating (San Diego, Calif.)

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

June 10 British Columbia

HEAVY CONSTRUCTION—LB & CA

▲ Fulton Bannister Ltd., 625 Northern Hardware Bldg., Edmonton, Alta., CA $1,500,000, constr. 50 mi. 34 in. natural gas pipe line from Cavendish west to Princess in Pincher Creek area; also 6,600 ft. 18 in. line which is a lateral to gas collection plant, Cavendish west to Princess, ALBERTA. The Alberta Gas Trunk Line Co. Ltd., 320-9th Ave. W., Calgary, Alta. Awarded May 1. CD 1/5/56.

▲ Hacquoil's Constr. Ltd., 1408 Brown St., Fort William, Ont. CA $1,231,561, Contr. A, constr. approx. 13,000 lin. ft. 48- to 60-in. sanitary trunk sewers and 4,300 lin. ft. 18- to 36-in. storm relief sewers, PORT ARTHUR, ONT. Ontario Water Resources Comn., East Block, Parliament Bldgs., Toronto, Ont. Bids Dec. 12, awarded Apr. 28. CD 10/31;
Foundation Co. of Canada Ltd., 166 Douglas St. W., Sudbury, Ont. $708,311, Contr. B, sewage treatment plant to handle 2 MGD, (Port Arthur, Ont.)

▲ J. H. Dupuis Ltee, 4324 Jeanne D'Arc St., Montreal, Que. LB $1,290,000, (18 bidders) 1 story, 200 x 300 ft. recreation centre, to provide indoor swimming pool, gymnasium, recreation hall, etc., Cote St. Paul Park, MONTREAL, QUE. City, City Hall, Montreal, Que. Larose & Larose, 8 Roselawn Cresc., Maunt Royal, Montreal, Que., archts. Brouillet & Carmel, 3600 Barclay Ave., Montreal, Que., engrs. Bids Apr 30. CD 4/8.

▲ Carter Constr. Co., Ltd., 419 Cherry St., Toronto, Ont. LB $1,429,000 (3 bidders) constr. marine towers and galleries at Quebec Harbor, QUEBEC CITY, QUE. National Harbors Bd., West Block, Parliament Bldgs., Ottawa, Ont.

BUILDINGS—LB & CA

▲ Piggot Constr. Co. Ltd., Piggot Bldg., 36 James St. S., Hamilton, Ont., LB $6,330,000, (4 bidders) CITY HALL, 10,000 sq. ft. city chamber, 5,000 sq. ft. penthouse, 12,000 sq. ft. bsmnt. area, 22,000 sq. ft. garage area, HAMILTON, ONT. City, City Hall, Hamilton, Ont. Bids Apr. 30. CD 4/1.

▲ Economy Constr. Co. Ltd., 786 Bay St., Toronto, Ont., CA $2,277,199, 215-unit row HOUSING, 11 single family dwellings and all services, PETAWAWA, ONT. Central Mortgage & Housing Corp., 650 Lawrence Ave. W., Toronto, Ont. Bids Apr. 17, awarded Apr. 30. CD 3/31.

▲ Mangold Investments Ltd., 3433 Bathurst St., Toronto, Ont., Owner Builds $1,200,000 four 4 story, 40 suites concrete block, brick APARTMENTS, Don Mills Rd., TORONTO, ONT. Henry Fliess, 224 Merton St., Toronto, Ont., archt.

▲ Eastern Constr. Co. Ltd., Box 235, Station Q, Toronto 7, Ont., Est. CA $2,000,000, WOMENS RESIDENCE, 6 story, bsmnt., 70,000 sq. ft. with 5 floors of sleeping quarters, main floor to have general reception room, etc., masonry walls, rein.-con., poured concrete fdn., University Ave., TORONTO, ONT. Victoria College, University of Toronto, Simco Hall, Toronto, Ont. Bids Apr. 24, awarded May 2. CD 4/17.

▲ Shell Constr. Co., 725 Decarie Blvd., St. Laurent, Que., Owner Builds, $1,500,000, HOUSING, 100 bungalows and split levels, units are 6 and 7 rooms, St. Genevieve Gardens, off Gouin Blvd. W., MONTREAL, QUE.

ALASKA

BUILDINGS—LB & CA

▲† J. B. Warrack Co., 400 2 Ave. W., Seattle, Wash., LB $2,093,000, (3 bidders) JUNIOR HIGH SCHOOL, ANCHORAGE, ALASKA, School Bd., Anchorage, Alaska. Bids Apr. 30. CD 4/14.

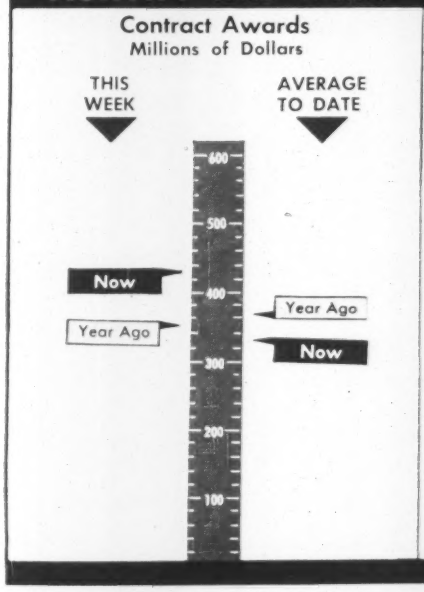
U. S. POSSESSIONS

BUILDINGS—LB & CA

▲† Pacific Constr. Co. of Honolulu, Honolulu, T.H., CA $8,429,400, 600 unit family HOUSING, Hickam Air Force Base, HAWAII. Contracting Office, Dpt. of Air Force, Bldg. T-243, Block 29, Hickam Air Force Base, Hawaii. Bids Mar. 25. CD 4/2, under LB.
(Proposal Advertisement see pp. 192 to 194)

Construction Scoreboard

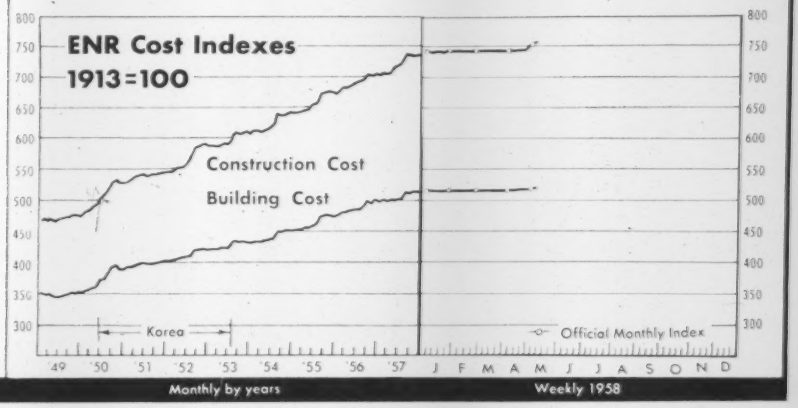
ACTIVITY THIS WEEK



COST INDEXES AS OF NOW

ENR INDEXES (1913=100), 20-cities' average	Week of May 8 1958	% Change from Apr. 10 1958	% Change from May 9 1957
Construction Cost	755.50	+1.3	+5.1
Building Cost	519.43	+0.4	+3.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2,080; Building Cost by 1,850. 1949 = 100: Divide Construction Cost by 4,770; Building Cost by 3,518.



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 20 wks 1958 millions	Chge '57-'58 %
All Heavy Constr.	$435.4	$6,716.2	−7
Private	200.5	3,141.8	−7
Public	234.9	3,574.4	−7
State & Municipal	181.6	2,789.1	+3
Federal	53.3	785.3	−32
By Type of Work			
Public			
Waterworks	3.7	109.6	−36
Sewerage	10.7	210.6	+25
Bridges*	17.5	196.0	−27
Highways	53.9	1,095.6	−1
Earthwork, Waterways	40.2	313.7	−38
Buildings, Excl. Housing	64.6	925.8	+8
Housing	9.5	375.7	+32
Unclassified	34.8	355.5	−29
Private			
Mass Housing	58.1	1,371.5	+19
Commercial	117.9	815.0	+18
Industrial	13.3	773.3	−42
Unclassified	11.2	173.9	−15

* Includes private bridges.

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

	Week of May 8	Cum. 19 wks 1958 millions	Chge '57-'58 %
Corporate Securities	$58.6	$2,219.0	−2
State and Municipal:			
All Except Housing	191.9	2,682.1	+27
Housing	...	20.3	−51
Federal Loans	...	71.1	−13
Federal Aid	...	....	−100
Total Nonfederal	$250.6	$4,992.5	+5
Federal Appropriations:			
Projects in U. S.	...	$603.2	...
Outside U. S.	...	....	...
Total New Capital	$250.6	$5,595.6	+18

CONTRACTS AWARDED

	1958 April (millions)	1958 4-Mos. (millions)	% Change from 1957 April	% Change from 1957 4-Mos.
Total U. S., ENR reported	$1,583.3	$5,414.6	+ 8	−10
Private	813.3	2,565.2	+11	−11
Public	770.0	2,849.4	+ 6	− 9
State and Municipal	588.5	2,243.6	+ 8	−0.4
Federal	181.5	605.8	− 2	−32
ENR Volume Index, 1913 = 100	585	480	+ 4	−11

NEW CAPITAL FOR CONSTRUCTION

Total U. S.	$1,074.1	$5,002.6	− 2	+20
State and Municipal Bond Sales	490.6	2,365.1	− 2	+22
Corporate Security Sales	486.4	1,964.2	−14	−10
Federal Loans, Aid (nonfederal work)	14.0	70.1	−44	+13
Federal Appropriations (federal work)	83.1	603.2	....	....

* Includes funds for outside U. S.

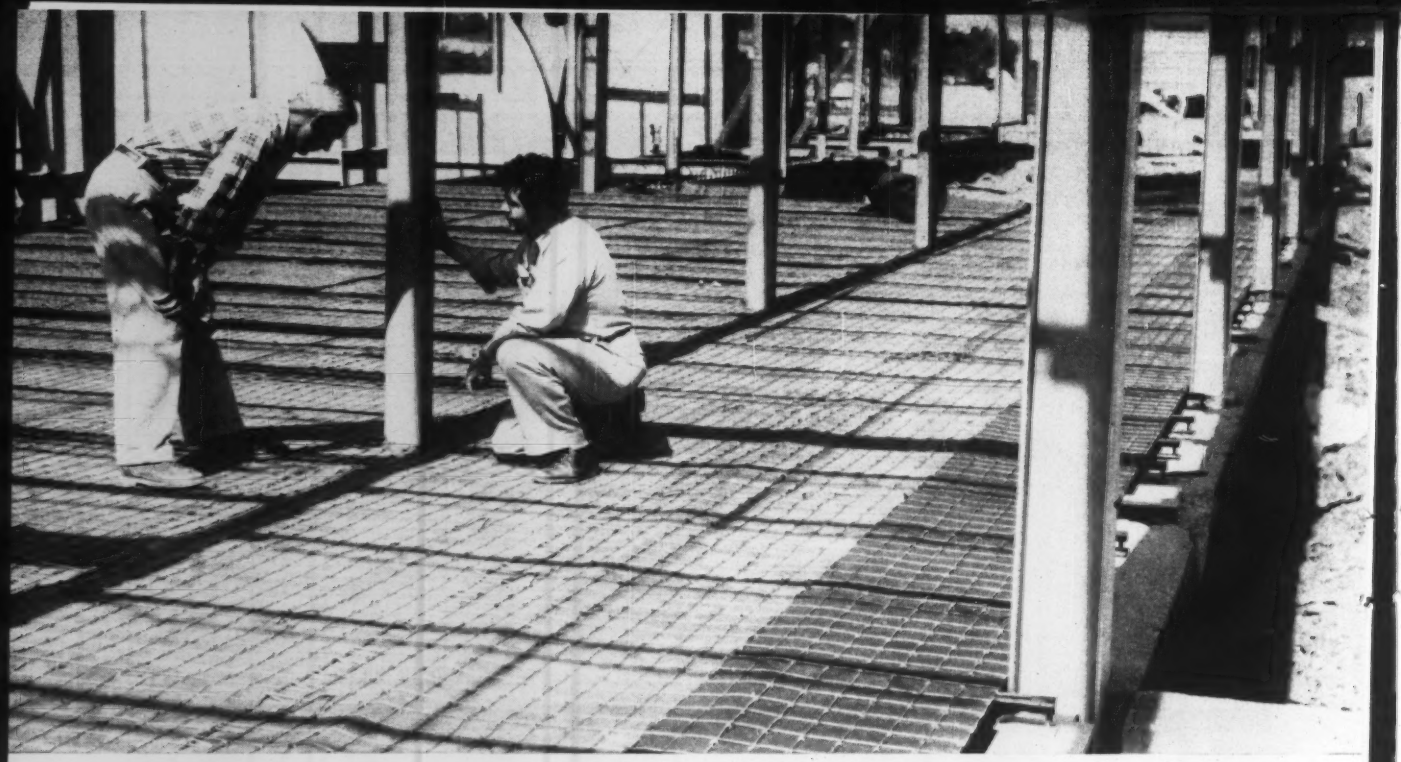
MATERIALS SHIPMENTS

Unit	1958 Jan. (J) Feb. (F) Mar. (M) April (A)	Cum. (No. of Mos.)	Percent Change from Year Ago Mo.	Cum.
Portland Cement, Bur Mines thous bbls	10,944(F)	24,562(2)	−28	− 9
Concrete Paving Awards, PCA thous sq yd	13,328(A)	30,923(4)	+70	− 3
Fabricated Structural Steel thous tons	337(M)	936(3)	− 2	− 2
Bookings, AISC thous tons	196(M)	544(3)	−39	−42
Reinforcing Bars, Net, AISI thous tons	141(M)	366(3)	−11	−18
Lumber, NLMA mil fbm	2,542(M)	7,308(3)	− 9	− 7
Orders mil fbm	2,407(M)	7,262(3)	−16	− 9
Production mil fbm	2,508(N)	7,311(3)	−22	−10
Douglas Fir Plywood, DFPA, ⅜" basis				
Production (average per week) mil sq ft	111.5(M)	110.4(3)	+16	+13
Orders (average per week) mil sq ft	125.8(N)	111.7(3)	+13	+16
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face mil bri	347.7(J)	347.7(1)	+11	+11
Vitrified Clay Sewer Pipe thous tons	101.0(J)	101.0(1)	− 6	− 6
Structural Tile, Unglazed thous tons	37.2(J)	37.2(1)	−20	−20
Asphalt Products, Bureau of Census				
Asphalt Roofing thous sales sqs	2,500.2(F)	5,474.9(2)	−39	−31
Asphalt Siding thous sales sqs	54.1(F)	116.1(2)	−40	−39
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable) mil lbs	66.0(F)	133.7(2)	− 8	−12
Wire and Cable mil lbs	20.5(F)	42.4(2)	− 7	−13
Extruded Shapes (soft alloys) mil lbs	45.2(F)	93.5(2)	+ 4	+ 1

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS thous	2,504(M)	2,492(3)**	− 9	− 8
Contractor Failures, Dun & Bradstreet				
Number	202(M)	555(3)	− 1	− 1
Liabilities thous	$11,921(M)	$30,536(3)	+14	+ 3

**Average per month



Fastest coverage with Steeltex. Steeltex roll, 125 feet long and 4 feet wide, unrolls quickly and is easily cut to fit around irregular-shaped objects like the steel columns shown above at Penn Township Senior High School near Pittsburgh. Steeltex provided reinforcing and form for 100,000 square feet of floors at this school.

12-Point Comparison Proves

Steeltex Floor Lath Provides Quality Construction But Can Cost Less Than Competing Materials

For more than 30 years, quality-conscious architects, engineers and contractors have specified Steeltex Floor Lath sold by Pittsburgh Steel Products Division of Pittsburgh Steel Company.

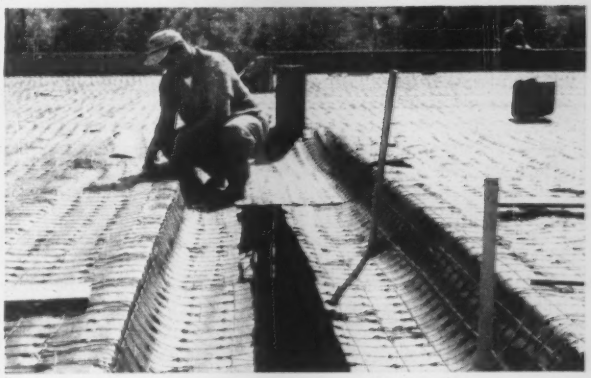
They realize that as a centering material—specially designed for joist construction—Steeltex speeds work, cuts costs and improves the quality of construction. That's why Steeltex has provided form and reinforcing for millions of square feet of floors and roofs set on steel, concrete and wood joists.

Here, at right, are 12 critical points of comparison which show why these men choose Steeltex over other centering materials.

12-Point Comparison

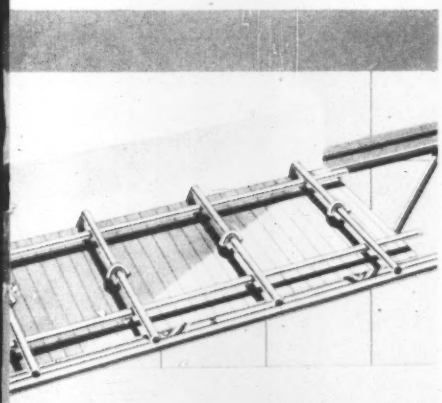
	Steeltex	Sheet Material
Engineering		
(1) Lateral restraint of top chord of joists	Yes	Not assured
(2) Positive reinforcement	Yes	No
(3) Galvanized	Yes	Extra Charge
(4) Continuous reinforcement	Yes	Only by adding mesh
Cost		
(5) Packaging	No charge	Extra bundling and packing charges
(6) Accessories	No charge	Extra clip and washer charges
(7) Lap	Side lap only	Side and end lap
(8) Additional reinforcing	None required	Additional mesh, 10 to 4 gage
(9) Additional reinforcement placing cost	None	Yes
Contractor		
(10) Material	One roll size spans different joist spacings	Many sheet sizes
(11) Weight handling	36# per 100 sq. ft.	⅛ HyRib Pl 44# ¼ HyRib Pl 60# Corrugated 76# Corrugated Galv. 84#
(12) Faster coverage	Rolls 4 x 125 ft.	Sheets 25 to 28½ inches 6 ft. to 16 ft. 3 inches

Steeltex is easily unrolled by one man. Steeltex weighs only 36 pounds per 100 square feet yet is strong enough to support heavy slabs. Steeltex saves precious construction dollars by permitting on-the-job changes at no extra cost. Steeltex has only a side lap for joining sections together. Clips are furnished free. Sheet material requires side and end laps plus additional reinforcing mesh, 10 to 4 gage. Steeltex needs no additional reinforcing.



Steeltex gives freedom of design. Steeltex, cut and bent easily and quickly here at Ecorse School in Michigan, covers a depressed sanitation facilities area in minutes. Steeltex provides continuous reinforcement. So does sheet material—but only after additional mesh is installed. Yes, Steeltex comes galvanized at no additional cost. There's an extra charge for galvanized sheet material.

Free accessories. Workman at Purdue University's new married student quarters uses clips furnished free to attach Steeltex to steel joists. Steeltex wire mesh reinforcing carries its waterproofed form right on its back and is specially designed for joist construction. Steeltex speeds work, cuts costs, improves quality of construction.



Next time you specify or use a centering material remember these facts. Steeltex, which carries its waterproofed form right on its back, saves time and money—improves quality of construction.

Put Steeltex' advantages to work for you as thousands of others have. Call your nearest Pittsburgh District sales office today. You'll be glad you did.

▶ See Sweets Catalog Section 2-B

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		Houston	Philadelphia	Warren, Ohio

New Orders for Construction Machinery

Though continued rise in contract awards spurs new order index, manufacturers revise outlook, play safe

Heavy construction contracts continued to climb in April, and March orders for construction machinery moved up sharply, reflecting the rise in contract awards during February and March.

Yet manufacturers of construction machinery have revised their estimates of future orders downward after a sobering look at first quarter sales and earnings. In the meantime, their prices held level and looked likely to remain so. The trend of machinery orders and contract awards is fixed by McGraw-Hill's Department of Economics and ENR. Price trends are from the U. S. Bureau of Labor Statistics.

Here are the details.

• **Order volume picks up**—The upturn in new construction contracts prompted contractors to step up their machinery orders in March, and the new orders index rose to 232 (1949=100). This represented a 16% gain over February orders and the largest volume of buying since July of 1957.

Although contractors bought less machinery this March than last, the gap has narrowed. Order volume was off 13% from last year, compared with declines of 24% for January and 22% for February.

• **Forecasts revised downward**—Machinery makers have lost some of the optimism they expressed during the first quarter (ENR Mar. 20, p. 182). Then they predicted that their first quarter volumes would set the three-month average of the New Order Index at 221. As it turned out, the average was no higher than 211, far behind the average of the index during the first quarter of 1957—264.

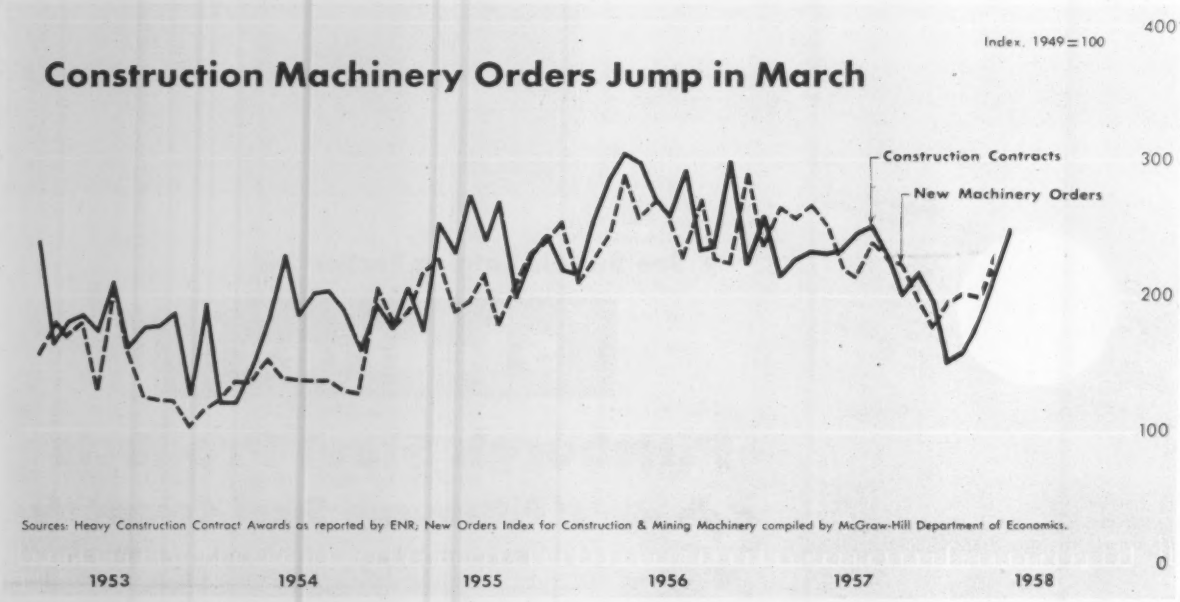
Now they have turned cautious—perhaps too cautious. There will be a definite rise in new orders over the next 12 months, they say, but far smaller than what they predicted in March. The second quarter of this year, rather than averaging 274 as was forecast earlier, will now average 233. This compares with the second quarter average of 228 last year. Business, they are saying, will be only a little better than it was last year. And this is the way manufacturers are looking at the third quarter as well.

For the third quarter the manufacturers estimate an average order index of 229, just a shade under the comparable figure for 1957—231, and well beneath their earlier estimate of 277. A slight rise in volume is predicted for the fourth quarter. Then the index will average 238, higher than the 191 recorded in 1957's sluggish fourth quarter but still highly conservative when compared with their earlier estimate of 273.

At longer range, manufacturers foresee a marked upswing in orders in the first three months of 1959. The index should average 259 in that period. It is then, they now believe, that the construction industry will really hit its stride.

• **Machinery prices steady**—The manufacturer's price for construction machinery held steady between February 15 and March 15, the BLS index shows. There have been few machinery price changes since October of 1957. The March 15 index is 165.4 (1947-49=

FIRST-QUARTER TRENDS



NEW ORDERS BEGAN TO RISE in March under the influence of the steep climb of construction awards during February and March. Manufacturers with first-quarter losses from big inventories and sluggish sales finally saw their products start to move.

Show Upturn

100), about level with last October's 164.9.

Prices probably will stay where they are for several months. Some manufacturers have inventories on hand now that amount to months of shipments at the current rate of new orders.

• **Business was disappointing**—It's no surprise that manufacturers have considered their earlier optimism. During this year's first quarter company sales and earnings dropped below the comparable period of last year. Two (Thew Shovel and Bucyrus-Erie) saw profit turn into loss and sales slip by more than 50%. Koehring's profit plunged close to the vanishing point.

Manufacturers, in making their mid-quarter forecasts, had depended on a big road program and signs that Congress was determined to make it even bigger. It wasn't apparent then that the sharp decline in private construction activity would offset much of the gain in road work. Nor that equipment in use on private work often would be shifted to highway jobs—a boon for the contractor but not for the manufacturer. In addition, the typical highway contractor already was working well below capacity and didn't need much extra equipment when work expanded.

Now that the revival of contract awards is once again serving to feed the manufacturer's order box, the worst appears to be over. Several voiced this feeling after witnessing the fluctuations of the first quarter. William L. Litle, chairman of Bucyrus-Erie Co., said:

"Incoming business in both March and April showed marked improvement over the preceding three months. It is to be hoped that this may prove to be the beginning of an upturn."

The firm's unfilled orders at the start of April amounted to $9.6 million against $8.7 million as the year began.

At Clark Equipment Co., George Spatta, president, expects both sales and profits to rise in the second quarter, though not to the levels of a year ago.

Julien R. Steelman, president of Koehring Co., recently observed that contractors had been buying new equipment at below estimated replacement rates for the last nine months. Now new orders are picking up, he said, though at the beginning of May volume was below the normal seasonal upturn.

At Baldwin-Lima-Hamilton Corp., president McClure Kelley reported that new orders in April were off "about consistent with the first quarter." Sales for the rest of the year, though, will probably not fall to first-quarter levels.

AND PERFORMANCE

Net Sales and Profits in Construction Equipment

COMPANY	QUARTER ENDING	SALES (in thousands) 1957 (Quarter)	1958	PROFITS (in thousands) 1957	1958	PROFIT MARGINS (percentages) 1957	1958
Allis-Chalmers	Mar. 31	137,950	119,668	5,100	2,307	3.69	1.92
Baldwin-Lima-Hamilton	Mar. 31	48,174	35,906	1,495	1,044	3.10	2.90
Blaw Knox	Mar. 31	46,480	38,256	2,066	1,623	4.44	4.24
Bucyrus-Erie	Mar. 31	24,762	11,166	1,709	d-653	6.89	d
Caterpillar Tractor	Mar. 31	186,668	127,461	14,615	3,405	7.82	2.67
Chain Belt	Jan. 31	13,819	12,620	964	680	6.97	5.38
Clark Equipment	Mar. 31	31,476	28,270	1,188	1,005	3.77	3.55
Gardner Denver	Mar. 31	16,860	14,048	1,908	1,337	11.31	9.51
International Harvester	Jan. 31	253,135	218,730	8,571	6,810	3.38	3.11
Jaeger Machine	Mar. 31	11,439	9,556	963	713	8.41	7.46
Joy Manufacturing	Mar. 31	33,542	23,474	3,047	1,303	10.16	5.55
Koehring	Feb. 28	13,985	9,123	568	1	4.06	.01
Link-Belt	Mar. 31	41,798	35,884	2,552	1,335	6.10	3.72
Thew Shovel	Mar. 31	12,028	5,497	412	d-148	3.42	d
Westinghouse Air Brake	Mar. 31	59,465	53,047	3,170	2,301	5.33	4.33

d = deficit

Bechtel Corp. to Design Nuclear Power Facility

Bechtel Corp., San Francisco, has been selected by the Atomic Energy Commission as the architect-engineer for a 75,000 kw nuclear power plant to be constructed at Hallam, Neb., about 50 miles west of Nebraska City.

The project will consist of a sodium graphite reactor (SGR) feeding steam to conventional turbo-generator equipment. It will take about 3½ years to design and construct the plant, which will be operated by Consumers Public Power District of Nebraska as part of its electrical generating system. A contract between the AEC and Consumers was signed last September.

Cost of the reactor portion of the plant will be about $29 million, of which Consumers is providing $5.2 million. In addition, Consumers will furnish the site and be responsible for constructing the turbo-generator portion of the power plant.

State Orders City to Supply Water to Growing Suburbs

The city of Milwaukee may have to spend $50 million over the next 20 years in addition to the $54 million water system project now under way, to serve incorporated cities and villages in Milwaukee County as a result of a state Public Service Commission order. The PSC ordered Milwaukee to serve the town of Wauwatosa on the ground that since Milwaukee had voluntarily held itself to be a public water utility by already selling water to six suburban customers, it had thereby assumed an obligation to provide service to any municipal water utility located in the county and contiguous to the city.

Chicago Gets New Weapon To Use in Fight on Slums

Renovation and renewal of privately-owned residential structures containing three or more apartments became mandatory in Chicago following passage of an ordinance designed to identify "ghost" owners of slum properties and make them directly responsible for their buildings' condition.

Owners of property now have to be available for service of summons and possible court appearance if building and sanitary code violations are found in their properties.

In the past, Chicago had difficulty tracking down the true owners of blighted buildings. The new law will affect an estimated 25,000 buildings.

Special Sessions

Connecticut votes extra spending, Maine needs money, Vermont sits tight

The recession and how to fight it has been a lively topic among state officials and lawmakers in three New England states. As usual, many pin their hopes on construction activity as a means of bolstering sagging economies and getting people back to work. But differences have arisen over what the states' treasuries should contribute to recovery.

In Connecticut the Republican controlled legislature, at a special session recently ended, voted a moderate program on extra spending, which totaled $52.5 million to be raised through the sale of bonds. Gov. Abraham A. Ribicoff, however, had urged approval of $410 million in new bond issues. Of this total, $345 million would have gone to highway construction and $65 million to expansion at state institutions.

Had the governor's program been approved, it would have boosted the state's total indebtedness to $1.2 billion —a record level—and one that "would have broken the state financially," according to Republican leaders. The Democratic governor's proposals, therefore, were overwhelmingly rejected.

The bond issues authorized by the legislature will provide $30 million to match available federal funds for highways, $15 million for state grants to communities for urban renewal projects, and $7.5 million for housing for elderly persons and a law school building at the University of Connecticut.

The legislature also extended unemployment compensation to 39 weeks from its former 26 weeks.

• **Maine calls special session**—Maine's legislature went to bat against the recession in a special session that started May 6. Gov. Edmund S. Muskie and legislative leaders are in agreement on the general problems to be solved.

Highways and liberalization of unemployment benefits will take the spotlight.

The State Highway Commission needs about $600,000 for immediate matching of federal road funds in the ABC road program. Another $900,000 will be drawn as an advance on 1961 and 1962 allocations, which the recent highway law allows. Maine, in this manner, will have available approximately $3 million in federal ABC funds.

Since last June, the Highway Commission has placed about $20 million in road construction under contract. Another $44 million is scheduled for contract by June 30, 1959. But to take full advantage of the emergency ABC program, the commission would have to shove into it projects anticipated for the regular program. However, there is doubt that these projects can be designed and right-of-way work completed before the December 1, 1958 deadline established for getting the emergency program to contract.

Available to the state is $1.6 million in federal-aid funds for the interstate highway system, but the matching funds required are not considered a problem because the Highway Commission feels that it couldn't spend the money in the next fiscal year anyway.

The legislature also must find ways of obtaining $1.5 million to offset an anticipated deficit next year. This deficit will result primarily from rejection at a March referendum of increased fees for drivers' licenses and motor vehicle registrations.

Changes also are expected to be made in the state's unemployment compensation laws.

• **No session for Vermont**—Vermont's Gov. Joseph B. Johnson also looks to construction to speed the state's economic recovery. But he insists that the situation is not yet bad enough to warrant special legislative action.

However, the governor is under pressure from Democrats, labor leaders and even some members of his own party, to call a session. The governor argues that the state's record highway program and state and local building activity, will generate business and employment without additional government intervention. He also is counting on the seasonal spring pickup in construction to keep his critics at a safe distance. Unemployment in Vermont has been hovering at the 10,000 level.

Contractor Failures Dip by 1%

Failures among construction contractors during this year's first quarter were 1% lower than during the same period last year, according to Dun & Bradstreet, Inc. However, the 555 contractors who ran into financial difficulties during the first three months had current liabilities of $30.5 million, which was 3% more than the liability total in 1957's first quarter (see table).

There were fewer failures this year than last among building subcontractors and contractors doing other than building construction.

General building contractors generally showed the greatest increase in failures with 235 recorded, a 5% increase over the first three months of 1957. Liabilities of those failing amounted to $17.7 million, which was a 4% rise over the same period last year. The slump in home and industrial building undoubtedly accounts for the rise in failures among general building contractors.

Measured by the size of liability, there were fewer failures involving less than $25,000 and more than $100,000 than among those between these liability extremes. In the middle range of $25,000 to $100,000, there were 11% more contractors failing and total liabilities of $9.9 million were up 7%.

Five regions registered increases in the number of liabilities.

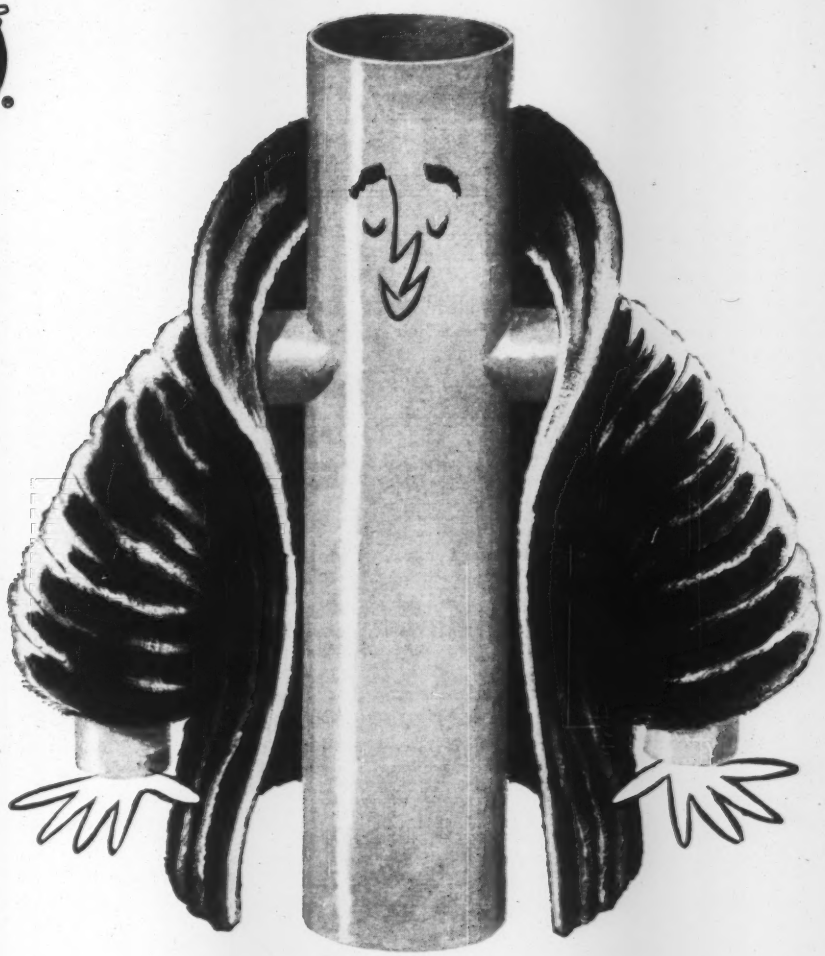
(*B&F continued on page 180*)

Contractor Failures by Type, Size, Region —First Quarter 1958

	Number 1958	Number 1957	% Chg.	Liabilities ('000) 1958	Liabilities ('000) 1957	% Chg.
U. S. Total	555	562	− 1	$30,536	$29,536	+ 3
By Type of Contractor						
General building contractors	235	224	+ 5	17,722	17,033	+ 4
Building subcontractors	288	301	− 4	10,928	9,544	+ 15
Other contractors	32	37	−14	1,886	2,959	− 36
By Size of Liability						
Under $25,000	279	305	− 9	2,964	3,520	− 16
$25,000–$99,999	206	185	+11	9,852	9,218	+ 7
$100,000 and over	70	72	− 3	17,720	16,798	+ 5
By Region						
New England	38	29	+31	2,501	1,216	+106
Middle Atlantic	134	147	− 9	7,286	10,643	−32
South	87	78	+12	5,767	3,247	+78
Middle West	110	103	+ 7	6,944	3,670	+89
West of Mississippi	70	66	+ 6	2,388	3,494	−32
Far West	116	139	−17	5,650	7,266	−22

Source: Reported by Dun & Bradstreet, Inc.

Barrett



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Dam Delayed

California water dispute upsets the work schedule on Oroville Dam

Completion of California's Oroville Dam will be delayed "at least a year" as a result of conflict among state legislators over water development funds. The estimate was given by Harvey O. Banks, state director of water resources, who called the outcome of the dispute—a $2 billion budget stripped of all money for water projects construction—"practically no progress."

If the session ended by frustrating the state's water development, the legislators did act favorably on other phases of California construction. They approved $780 million in bond issues for a variety of projects. The bonds will be submitted to voters in the November election. If approved, there will be a $300 million issue to continue state financing of veterans' home and farm purchases; $220 million for classroom construction in local school districts; $200 million for construction of state buildings at the University of California, state colleges and other institutions; $50 million for improvement of San Francisco harbor and $10 million for small boat harbors throughout the state.

Because of the water funds conflict, approval of the over-all regular state budget, had been held up weeks beyond the date on which consideration of the budget automatically is cut off (ENR April 17, p. 28).

• **Water development stalemated**—By the end of the wrangle, representatives of southern counties in control of the Assembly (the lower house) had fought northern-county legislators to a standstill on the issue of how much money and for what. They were holding out for some permanent guarantee of water supplies from the vast lake to be created by Oroville Dam. Though the project is designed to feed water into southern as well as northern counties, present statutes give counties of origin priority, so that the south's share might be reduced in time of shortage.

At one point the Assembly was willing to approve a $54 million appropriation allowing relocation work as well as planning and land acquisition. But the Senate, in northern-county control, insisted on enlarging this to $83 million. The extra money would pay for construction start on the dam and canals to feed water into the San Francisco area.

The result was a deadlock, and Gov. Goodwin J. Knight began to plead for a compromise as time ran out for regular budgetary session and the legislature went into extra innings.

After the Easter recess, the legislature reconvened to hammer out an agreement that would dislodge the budget. The southern representatives withdrew their $54 million water work concession and forced northern legislators to accept far harsher terms: an appropriation of $14 million, only enough for the department of water resource's "housekeeping activities," which include planning work on the project.

• **Money for planning**—Mr. Banks was cheered by the planning funds. They were generous, he said, and would permit hiring some additional engineers after July 1. The refusal of the legislature to provide construction funds, however, upset his hope of adding several hundred engineers for design work.

He commended the legislators for another action. They approved a $10 million fund to guarantee the federal government payment of costs allocated locally to Corps of Engineers' dam projects. But to Director Banks, who had outlined a far-sighted plan for water development to the legislature a year ago, this was small comfort. He was left with the problem of what to do now that the $25 million appropriated for railroad and highway relocation at the Oroville site is nearly spent and further progress seems mired in regional rivalry.

Low Bidder by Error, But Takes Job Anyway

Shortly after Edward F. Capaldi, Lincoln, R. I., contractor, was awarded a $107,280 sewer and storm drain job in Providence, he discovered a $56,000 error in the bid. He notified the Providence Board of Contract and Supply that a member of his office staff had written $2 instead of $12 on the bid form as the unit price for excavating 5,600 cu yd of rock. The excavation total, therefore, should have been $67,200 rather than $11,200.

After some hard thinking, however, Mr. Capaldi decided to perform the work at his bid price "to keep my name clean with my bonding company," he told an ENR reporter. And the city let him keep the contract.

"I don't think we'll lose any money, but we won't make any either," he commented. "What it means is that I'll have to check up on everything myself from now on."

The next highest bid was $132,402, which was $25,122 more than the faulty bid.

Population Bulge

Public works to soar after 1965 with the increase in formation of new families

Don't look for strong demand for new public facilities between now and 1965. It will be relatively moderate until then because of the present composition of the population. After 1965, though, demand for houses, municipal services and schools should start climbing. The increase may reach explosive proportions by 1975, when the 25-to-34 age group will be 35% larger than it is today.

These are the major conclusions of a study the Investment Bankers Association of America made of the U. S. population and its effects on the state and municipal bond market. For the construction industry the study helps fix the outlines of future demand for housing, schools, water and sewer facilities, and other capital improvements tied directly to the consuming public.

Here are the trends the study uncovered:

• **Between 1956 and 1965** there will be less demand for capital improvements arising from population growth because the key age group (25 to 34) is growing more slowly than in the postwar decade. People in this group were babies in the 1930s. In 1955 there were 24.1 million of them; in 1965 there will be only 21.5 million.

• **After 1965** and through much of the 1970s state and municipal governments are likely to face an unprecedented demand for capital improvements as the people born in the 1940s burst into the home-buying, children-rearing age group. From them will come another bumper crop of children requiring elementary schools, which means heavy financing and a consequent increase in state and municipal debt.

• **Between now and 1970** the need for new elementary and secondary school facilities may be less than it is today. The school population at those ages is growing more slowly than in recent years. Perhaps 1958-59 will be the peak year of the 1958-1970 period.

• **Pressure for college facilities** will build up rapidly after 1960. This is both because more high school graduates are attending college and because the college-age group will be growing rapidly in the late 1960s. The U. S. Office of Education predicts that college enrollments will double between 1956 and 1970.

• **Capital requirements for education,** it's apparent, are shifting in character. Currently the emphasis is moving from

elementary schools to high schools. During the 1960s a much larger share of construction and capital spending will have to be directed to colleges.

The study concludes by urging state and municipal governments to plan now for the enormous demands waiting around the 1965 corner.

Ax Hits Building

Construction reduced as Florida's revenue drops

The Florida State Cabinet, acting in the wake of a sharp drop in sales tax receipts, has cut construction expenditures of $65 million planned for 1958 to $34.5 million. This construction curtailment directly reflects the revenue decline, as the Florida constitution prohibits the sale of state non-revenue bonds.

The action was forecast early this year when Gov. LeRoy Collins said that some public construction already authorized would have to be curtailed because revenues were falling short of estimates (ENR Jan. 9, p. 100).

On the basis of a predicted rise in sales tax income, the 1957 legislature appropriated $664 million for the biennium, of which $102 million was for building during the two year period.

In February, a temporary halt was called to projected construction plans until the state could more accurately determine the extent of income flow. Last week there was little doubt as to which way income was going—down. The ax dropped, but not before Comptroller Ray E. Green warned that the state general fund probably would be totally expended by November despite cutbacks in construction and operating expenses. After that, he said, the state will have to tap earmarked accounts to keep going until tax collections pick up in March. He estimated the deficit at $6 million in December, $10 million in January, and $8 million in February.

"It's going to be next March before we are back in the black," he said.

Governor Collins was confident that the state would be able to ride out the slump by making economies and would need no tax increase. The crisis, he said, was brought on by a combination of the nation-wide business slump and hard winter freezes.

Among the projects to go ahead are the $8 million campus of the University of South Florida, to be built at Tampa; a new prison at Raiford; an institution for mentally retarded children in Lee County; and part of a junior college building program.

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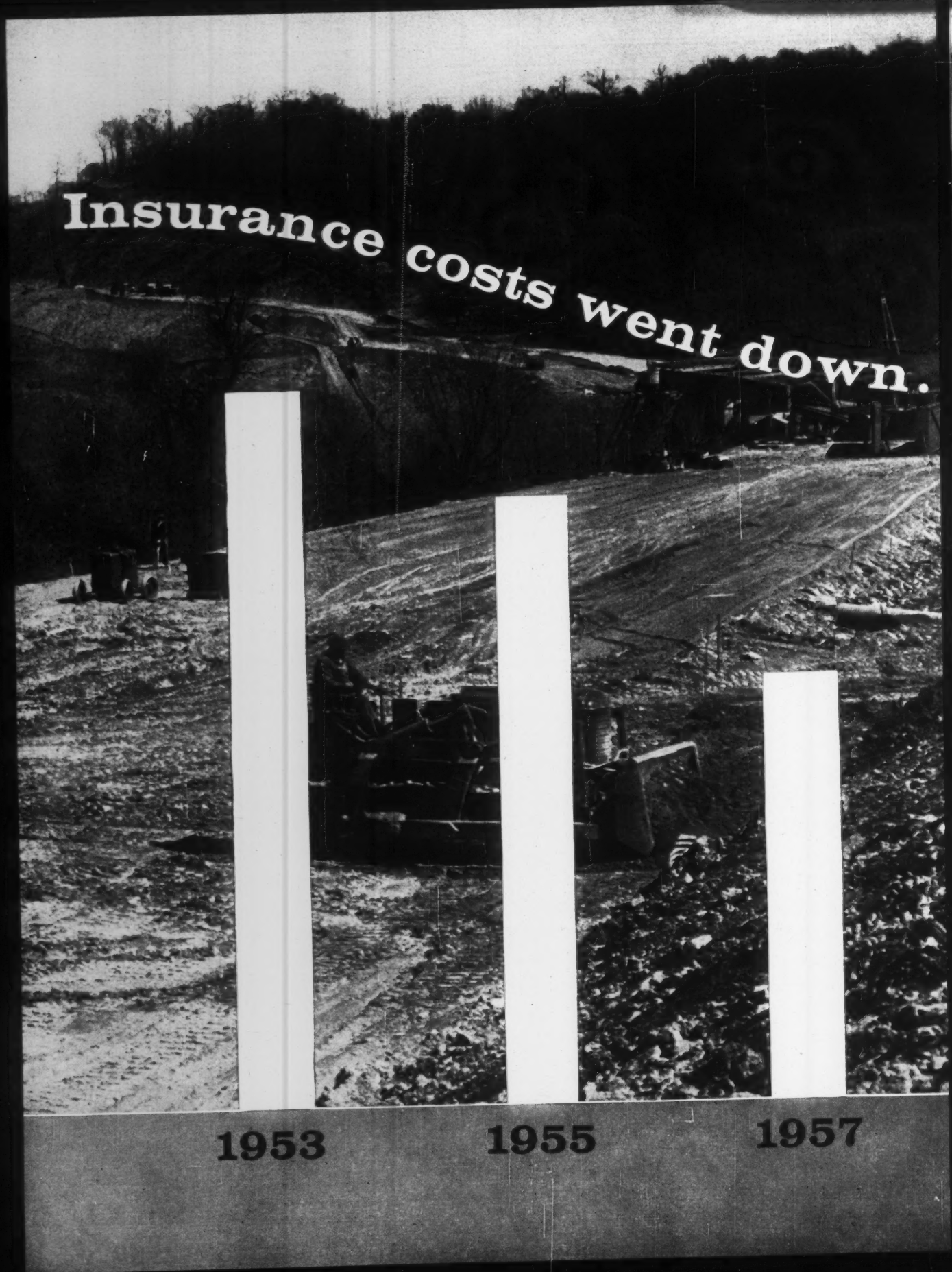
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Rash of Strikes Hits Construction Work

Collective bargaining deadlocks bring many projects to standstill as contractors seek lower building costs

Millions of dollars worth of construction across the nation has been halted, slowed or threatened in the last two weeks as collective bargaining negotiations have broken down. The list of trouble spots is long.

But despite generally strong contractor resistance to current wage demands, contract settlements continue to produce, as they did last year, hourly wage gains of 15 cents or more in many cases. At the same time, deferred increases under existing long-term contracts are hitting as high as 37½ cents an hour.

Stumbling blocks in most of the bargaining stalemates have been basic rate demands. Net results, however, have been quite diverse. Take a look:

- In Boston, laborers have won a 30 cent hourly wage boost in a three-year contract after striking for 21 days over wages. But in Hartford, Conn., where laborers have been on strike since April 1, a 57 cent increase in a proposed three-year pact is not an issue; dispute centers around an unusual demand that subcontractors, working on any job with the general contractor, pay the wage scales of the general contractor.
- In Chicago, homebuilders, who have been backed into a corner, say they are forced to go along with a "deplorable and unfortunate" 30 cent wage boost won by carpenters in a two-year contract with commercial builders. In New York, however, the Niagara Falls Home Builders Association independently signed with the carpenters for a 7½ cent differential.
- Strikebound contractors in Cleveland have failed so far in getting labor to adopt a cost-cutting code of work practices. But several unions in Missouri already have agreed to a similar code.
- In Detroit, the Associated General Contractors and Metropolitan Builders Association have tried unsuccessfully to sell labor a six-month wage freeze. Lathers in Chicago and woodworkers in Portland, Ore., however, have voluntarily frozen their wages for a year.
- The laborers' contract in Boston sanctions a coffee break and gives workers the right to a five minute breather. But in Cleveland, contractors are asking that the coffee break be banned by contract.
- While existing strikes have been authorized and accepted in most cases, contractor associations in Portland, Ore., Cleveland and British Columbia have tried or threatened retaliation with association-wide lockouts.

• Pace setting?—Working against contractor efforts to curb rising building costs are two factors that are bolstering labor's current demands—deferred wage increases now becoming effective and sizable gains won by various local unions earlier this year.

According to figures published by the U.S. Labor Department's Bureau of Labor Statistics, the average hourly scale of all construction trades combined climbed to $3.25 during the first quarter of the year.

Raises were typically 10 or 15 cents an hour. In a sixth of the cases, the wage increases were for more than 15 cents.

The new average for construction rates put the level 58% above the average for the three years 1947-49, the bureau reported, and 5% higher than in April of last year. Average increase since April of 1957 amounted to 15.3 cents, although among individual trades the average varied from 9.6 to 18.6 cents an hour.

In the area of deferred wage increases, some indication of the effect of long-term contracts has come out of California, where the following wage boosts became effective May 1 under long-term contracts with the Northern and Central California Chapters of Associated General Contractors:

- Carpenters and cement masons received a 15 cent increase.
- Laborers got an additional 18 cents in all classifications except concrete laborers, wet or dry, who received 28 cents.
- Increases for operating engineers ranged from 20 to 23 cents except for those on power shovels, cranes, clamshells, draglines and backhoes, who advanced 33 cents.
- Teamster wage boosts ranged from 20 to 37½ cents.

• Strikes—In a climate of recession and against this background a host of labor contracts expired April 30 without new contracts to replace them.

Results have been felt from New York to Oregon and among the areas hardest hit has been New Jersey, where contractors have tried to hold the line on wages.

As of last week, an estimated half billion dollars worth of construction work in five counties had been halted as a strike against building contractors by over 7,000 carpenters, laborers and bricklayers moved into its second week. Wage demands were ranging from 25 cents to a $1.00 an hour.

Demands have been branded as "unreasonable and reckless" by Paul Brienza, managing director of the Building Contractors Association of New Jersey, which has long advocated a general wage freeze pending re-evaluation of present wage trends. Mr. Brienza has called upon contractors to "resist the folly of these demands and the irresponsible behavior of forcing men out of work over unnecessary strikes in these difficult times."

One bright spot is the fact that five bricklayer locals in New Jersey's Essex County have agreed to extend their contracts for one year without a wage boost.

Elsewhere in New Jersey, bricklayers (Camden County) have signed for two years with a 10 cent raise this year and 20 cents next year, and laborers in two southern counties have agreed to a 25 cent increase over two years.

Meanwhile, New Jersey contractors face new headaches from other quarters. The operating engineers (Local 825) have refused to deal with lawyers in bargaining negotiations and will include in their demands for a July 1 contract an employer contribution to a supplemental unemployment compensation fund; ironworkers, whose contracts with BCA end in June, will ask for 90 cents over three years.

• Other areas—In Cleveland, where the Building Trades Employers Association has been trying to hold down costs by adoption of a work practices code, a building trades' strike, triggered off by asbestos workers, and an employer shutdown had a spotty effect last week. Some projects in a four-county area were halted and an estimated 10,000 craftsmen were idle.

Contracts covering 40,000 workers in 19 trades have expired. Wage demands are 25 cents. Conditioned on acceptance of the proposed code for increased productivity, contractors had

offered 6 cents plus a November cost-of-living adjustment.

In Detroit, 6,000 carpenters, who are asking for a 42 cent package increase over two years, walked out on strike against the builders association last week after contractors had failed in their request for a six-month wage freeze by the building trades.

Increases asked by trades in other negotiations are 19½ cents for bricklayers, 25¾ cents for cement workers and 15 cents for laborers.

In the meantime, members of the AGC in Portland, Ore., had shut down heavy construction projects to combat strike tactics of laborers (heavy) who were asking for a 20 cent boost, a 10 cent pension contribution and travel allowance in a one-year contract. Memphis, Syracuse, N. Y., several areas in Delaware, and Des Moines also were added to the list of construction strikes.

• **Settlements**—In other areas, a number of settlements were reached. Among them were these:

• In Chicago, electricians agreed to a 25 cent raise effective June 1 and to a 2% cut in their health and welfare contribution. Carpenters signed a two-year contract with commercial contractors for 20 cents this year and 10 cents next year.

• Four unions—bricklayers, cement masons, operating engineers and laborers—in Omaha settled with the AGC for 12½ cents this year and 10 cents next year. Lathers agreed to 10 cents for each of two years.

• In Rochester, N. Y., carpenters in a five-county area agreed to a two-year contract for 15 and 10 cents.

• Laborers in Boston have a new three-year contract for 30 cents in four installments—10, 5, 5 and 10 cents.

• In Des Moines, painters took 13 cents for one year; roofers 12½ and 12½ cents in a two-year contract; bricklayers, carpenters, lathers, plasterers and cement masons signed one year contracts for 12½ cents.

Plasterers Union Gets New General President

The Operative Plasterers and Cement Masons International Association has accepted the resignation of John E. Rooney as general president, effective July 14.

Mr. Rooney, who has headed the union for 18 years, was granted a leave of absence until his resignation becomes effective.

Vice President Edward J. Leonard was elected to succeed Mr. Rooney.

Friction Over Jobs

Oil workers say building trades demand industrial work belonging to them

The jurisdictional conflict between craft and industrial unions in the AFL-CIO continues to smolder as the Oil, Chemical and Atomic Workers International Union accuses the building trades unions of efforts to steal jobs of its members.

Core of the dispute, which also involves the National Constructors Association, is a charge that the building trades are not only demanding all new construction work but are also claiming the right to do maintenance work that has belonged to the oil workers.

Question of what work falls within the jurisdiction of which union has been one of the AFL-CIO'S most knotty problems. Construction unions have claimed that the old CIO unions are trying to obtain for their production workers a lot of work that properly belongs to building tradesmen.

After many months of effort, the AFL-CIO Executive Council, through a special committee, came up with a peace formula in February that sets this pattern for settling jurisdictional disputes: New building construction is considered work of the building trades; production and running maintenance work belongs to industrial unions; work falling between these two "clear areas" should be done by the union that has established the practice of doing it in the plant, area or industry concerned.

In spite of this, OCAW charges, building tradesmen "now insist that industrial unions give up all new construction, even where they have done it in the past, but they are not in turn willing to give up maintenance work they have been doing." The union is filing complaints with the AFL-CIO.

One of OCAW's complaints is a claim to maintenance work asserted by the United Association of Journeymen and Apprentices in the Plumbing and Pipe Fitting Industry in a national industrial maintenance agreement with the National Constructors Association. The agreement covers maintenance, repair and renovation work in various industrial facilities, including oil refineries. "Yet in the face of this attempt to take over refinery and chemical plant maintenance," OCAW charges, "craft unions have continued to complain to the AFL-CIO whenever members have done minor construction and alteration work in their plants."

In voicing its concern over the jurisdictional friction, the union makes this observation: "The conflict over jurisdiction is particularly intense at this time because of unemployment. One of the strongest functions of craft unions is to get jobs for their members. With the present shortage of jobs, the craft unions are under pressure to move in on industrial workers and take away their jobs."

Success of the peace plan has been tenuous and complaints have not been limited to either side. Only recently, friction between the building trades and steelworkers unions has presented the AFL-CIO with a new dilemma (ENR May 8, p. 120). Over the protest of construction unions, steelworkers said they will not give up new construction work they have traditionally done.

Chicago Contractors Warn Against Featherbedding

A tempest in a coffee pot has been stirred up by contractors and union leaders in Chicago.

Some 600 contractors, both general and subs, and officials of the building trades unions have posted construction site notices against featherbedding practices, including coffee breaks and jumping the gun at quitting time.

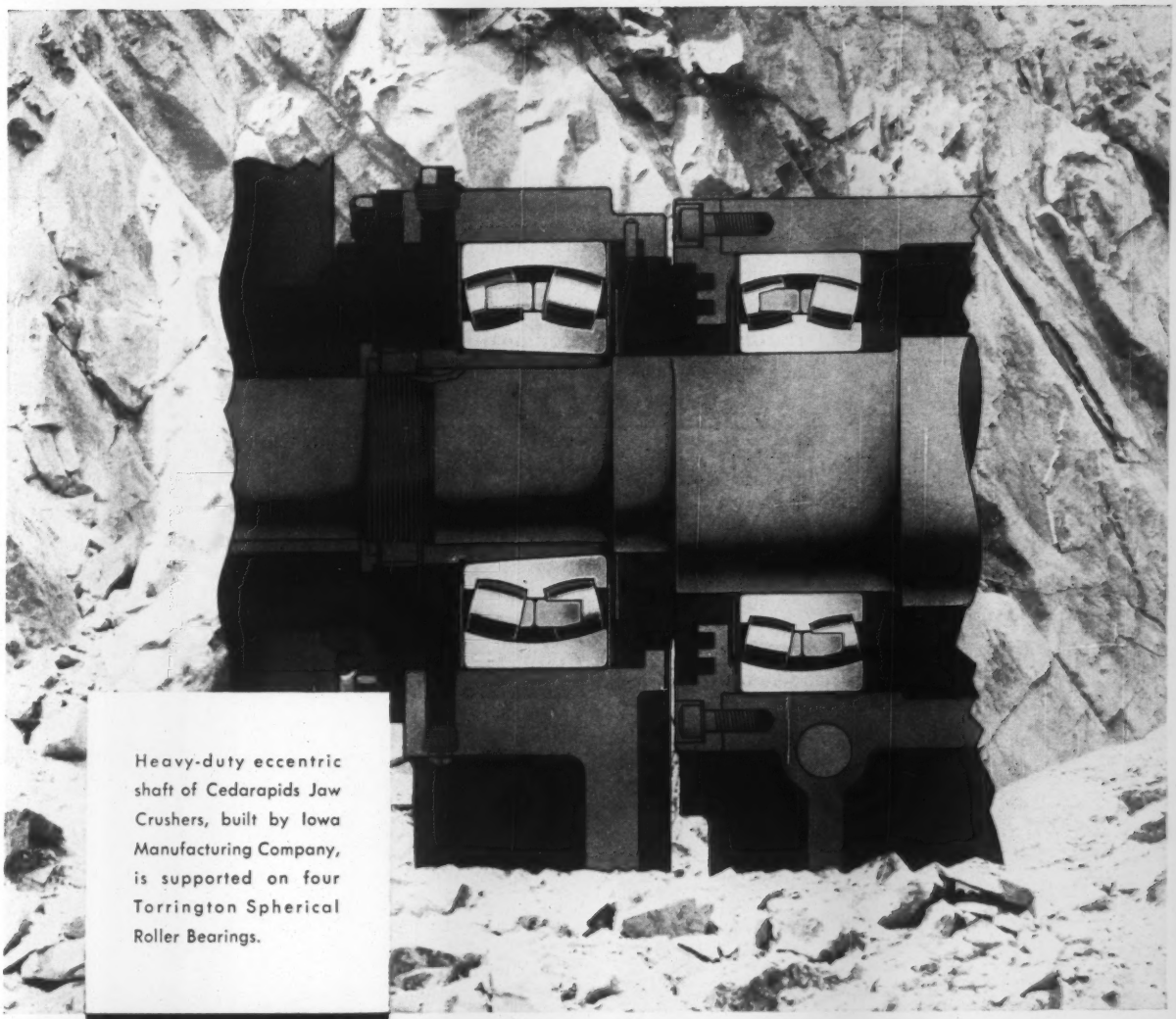
The warning notices contain the 10-point statement of principles (known to many as the "Ten Commandments") adopted earlier this year by the presidents of the international building trades unions in an effort to eliminate wasteful work practices.

H. M. Stanton, executive secretary of the Chicago Building Construction Employers Association, estimates that labor costs can be reduced 10% to 12½% through enforcement of the policies contained in the statement.

Stephen Bailey, business manager of plumbers' Local 130, said he has "never received a coffee break complaint from a contractor or anyone else" but pledged contractors this support: "We will stand behind the employer 100% on enforcing starting times and on bona fide complaints of featherbedding whether the complaint comes from the contractor, architect, owner or tenant. If a man doesn't do his job in the building trades on one day, he isn't there the second day."

Patrick Sullivan, head of the Chicago Building Trades Council, minimized the prevalence of the coffee break among construction workers and said it's "tiny" compared to commercial and government standards.

(*Labor continued on page 190*)



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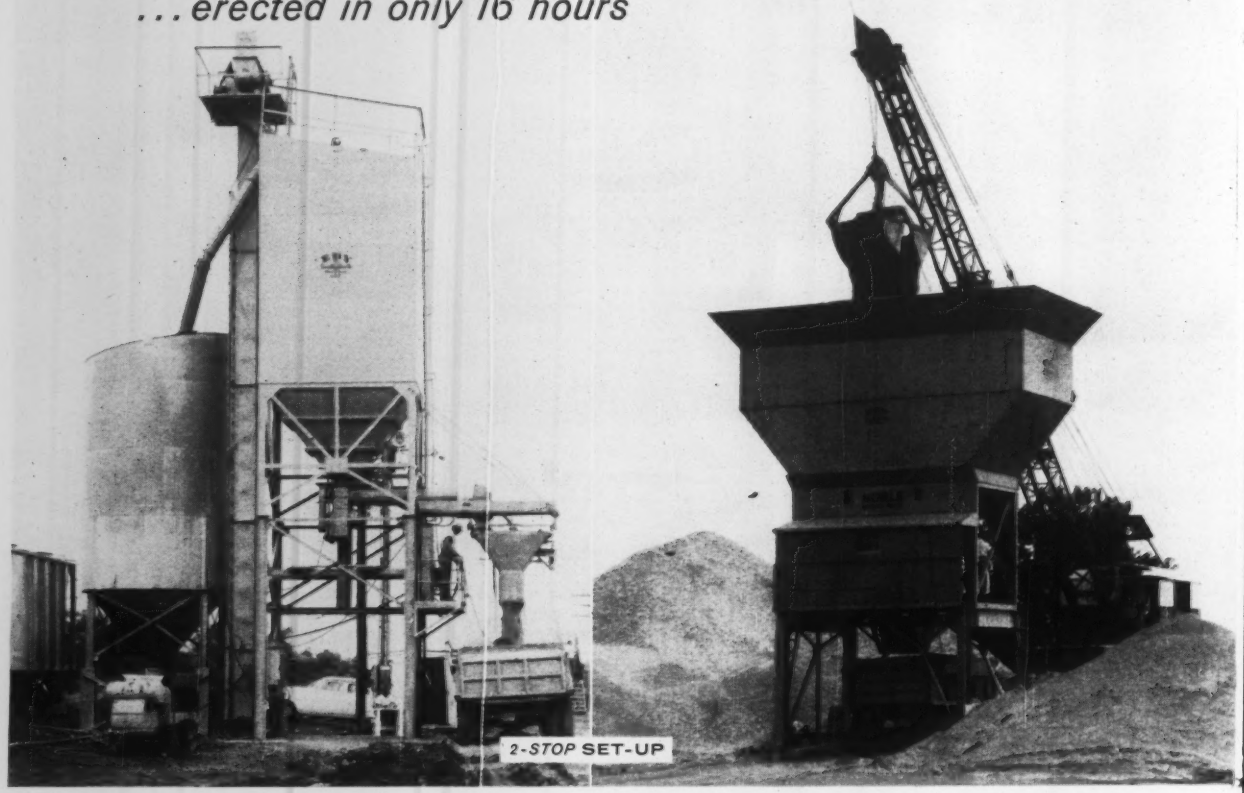

Martin K. Eby Construction Co., Wichita, Kansas, required a batching plant to supply concrete for a 100,000 square yard extension of airfield runways at Rosecrans Field, St. Joseph, Missouri. Their NOBLE plant having completed a job at Wichita, Kansas, 300 miles away, was dismantled in 10 hours, transported by rail to St. Joseph, Missouri, and reassembled in only 16 hours on low-cost slab footing. The plant batches sand, aggregates and cement in a *2-stop* set-up. The cement batcher weighs, records and discharges 742 lbs. of cement in 12 second cycles. The twin aggregate batcher weighs, records and discharges 4300 lbs. of materials in 15 second cycles. Plant output is over 300 cubic yards per hour. Overhead aggregate bins are charged with a 3½ cubic yard clamshell bucket. Scales, controls, electrical system and other major components are factory installed.

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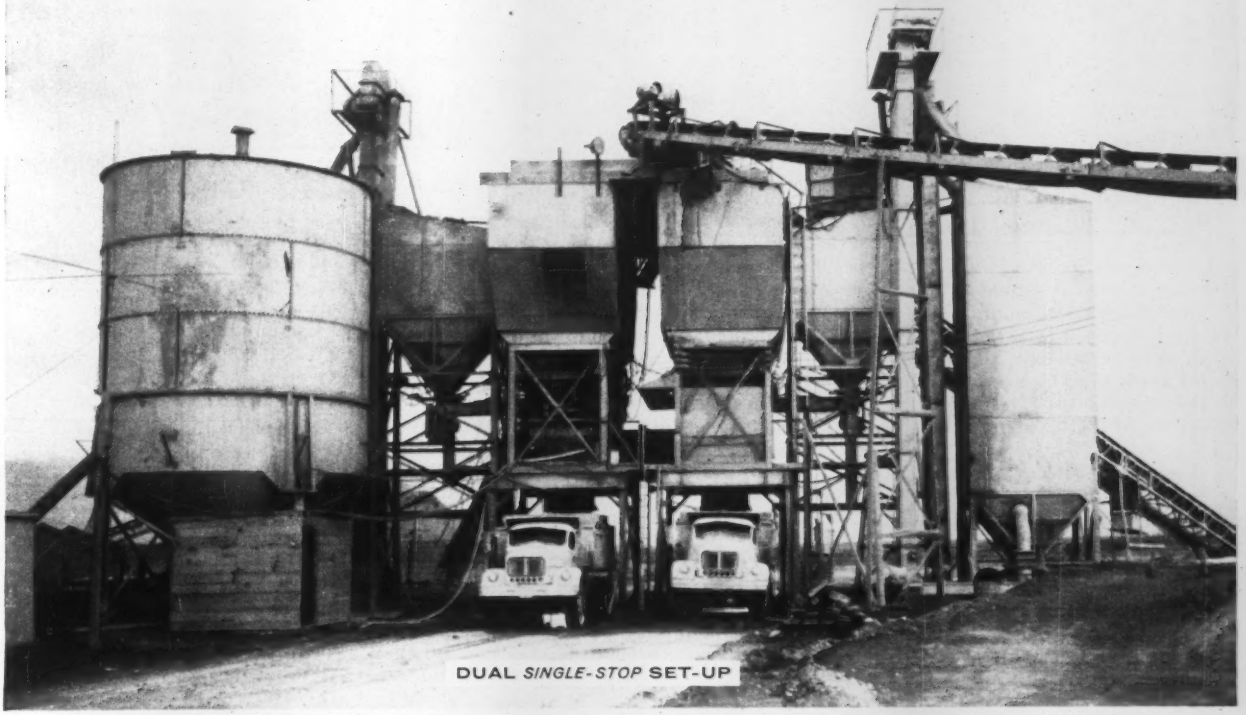

DUAL *SINGLE-STOP* SET-UP

Two NOBLE plants are batching materials for the construction of 258,000 cubic yards of portland cement concrete pavement at Mather Air Force Base, California. Operating considerably under capacity, the plants load dry batch trucks supplying 4 dual drum pavers. 3 different materials . . . 1½" rock, ¾" rock, sand . . . are stockpiled separately and supplied to both plants by three independent conveyor systems operated by one man. Each plant batches both cement and aggregates and has 150 tons of overhead aggregate storage and 375 barrels of overhead cement storage. Separate ground silos store an additional 3,600 barrels of cement. From its former location at McClellan Air Force Base, California, one of the NOBLE plants was dismantled, loaded and hauled by trucks within legal highway width to Mather Air Force Base, reassembled and put into operation all within 10 days, reports Henry J. List, Project Manager for Gordon H. Ball, Inc., general contractor.

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Congress Delays on Labor Laws

Jobless pay and welfare fund bills still in committee as Congress debates scope of general labor law changes

The likelihood of any immediate changes in federal labor laws diminished last week when the House Labor Committee defeated Republican efforts to tie Taft-Hartley Act amendments to the welfare fund disclosure bill now before the committee.

Result is that the scope of the bill, which generally meets with the approval of organized labor, will not be broadened and hearings on general legislation will be postponed. Unions in the AFL-CIO fear the passage of punitive and restrictive measures under the guise of corrective legislation and hope to keep the lid on the Taft-Hartley Act until the climate of public opinion becomes more favorable.

Bill now before the committee is the Douglas-Kennedy-Ives proposal for rigid disclosure requirements to protect employee health, welfare and pension funds. It recently was passed by the Senate. Its passage and House approval of a jobless pay bill now before the Senate mark the first positive steps taken by Congress in several weeks of bitter debate over what should be done in the field of labor legislation.

Both steps occurred fast on the heels of an unsuccessful attempt led by Sen. William Knowland of California on the Senate floor to open the gates to federal legislation the AFL-CIO hopes to avoid.

• **Jobless pay**—The jobless pay bill, on which Senate hearings open this week, would permit states to use federal funds to increase the number but not the amount of weekly unemployment insurance benefits to which an unemployed worker is entitled. Duration of payments would be extended by one-half of a state's present payment period. Only workers presently covered would be benefited—and then not until they had exhausted their regular benefits. Funds so used by the states would be repaid out of the proceeds of a higher tax on employers or out of a state's general treasury.

The measure represents adoption of an earlier Administration proposal and rejection of a more liberal Democratic bill that was considered by many to be an outright dole. None of the proposals, however, contains the long-range unemployment insurance improvements repeatedly requested by labor.

(House action on the proposal was taken just as Commerce Secretary Weeks reported that mid-April unemployment was 5,120,000, representing a slight drop that was seasonally far less than normal.)

• **Bill of rights?**—Center of present controversy over general labor legislation is a bill introduced in January by Senator Knowland. He calls it a" bill of rights" for labor designed to promote union democracy and to protect the rights of individual union members.

But in union circles it's considered strongly anti-labor. Many in the building trades feel it is intended to and could strangle unions with red tape and drown them in confusion.

The Knowland proposals would require periodic election of union officers by secret ballot, limit union trusteeships over locals, control the use of funds, make it easier for the rank-and-file to change constitutions and by-laws, grant the right of recall of union officers, require strike authorization by secret ballot, eliminate union-management collusion and clamp down on union membership restrictions. Severe penalties for violations would include loss of a union's federal income tax exemption and denial of access to the National Labor Relations Board.

But the provisions most loudly criticized are those giving minority interests —15% of membership—the right to recall officers and to get NLRB assistance in amending rules and by-laws, in repealing union decisions, or in supervision of a strike vote. Such provisions, labor claims, could completely hamstring union activity and inundate the labor board.

Despite a wide Congressional difference of opinion on the scope of any legislative program beyond fund disclosure and jobless benefits, observers generally feel that the Senate may pass some form of legislation to curb union abuses but that in this election year it will die in the House.

Operating Engineers Lose Claim to Welding Machine

The National Labor Relations Board last week ruled that Local 825 of the operating engineers union in New Jersey cannot force contractors to hire an engineer to start and stop electric welding machines.

Hailed as a victory over featherbedding by the Mechanical Contractors Association of New Jersey, the ruling stemmed from an unfair labor practice charge filed by the association and a New Jersey contractor, following a number of work stoppages over the issue last year.

The union has until May 17 to notify the board of its acceptance or rejection of the ruling but already has indicated that an appeal will be taken.

Basis of the ruling is that the union has no legal right, either by certification or contract, to assert jurisdiction over the welding machine. And this, incidentally, is in line with one of the work practice codes recently adopted by the international building trades unions which state that jurisdiction over welding tools belongs to the trades using them.

The NLRB decision against the engineers marks the latest development in many months of New Jersey contractor resistance to union efforts to extend jurisdiction to the maintenance of small power-tools.

A Cement Strike?

Chances of a peaceful settlement called dim

The stage is set for a major strike in the cement industry.

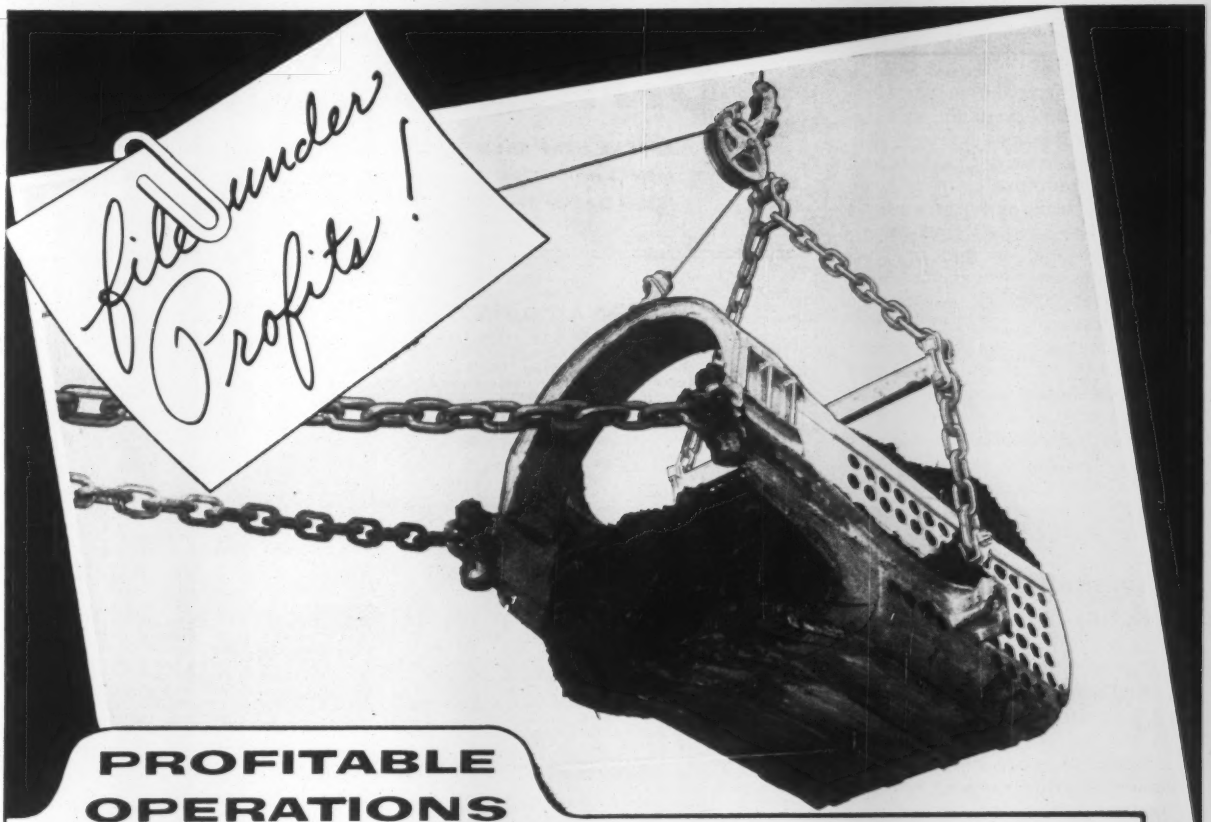
Felix Jones, president of the United Cement, Lime and Gypsum Workers International Union, last week reported that over 90 labor contracts, covering some 20,000 workers in the cement industry, expired May 1. Union members, he said, have remained at work on a day-to-day basis hoping to avoid a major strike. Many of the union's locals have authorized strike action.

Companies with which the union is negotiating include Alpha, General, Lehigh, Lone Star, Marquette, Medusa, Penn-Dixie and Universal Atlas.

In disclosing the possibility of a major strike, Mr. Jones said the present situation has "all the earmarks" of the one that led to the national cement strike last year. He accused union employers of a "callous unconcern" for a peaceful settlement and considered it increasingly evident "that thousands of our members will have to strike."

Union demands, estimated to be worth about 25 cents an hour, include these: a minimum wage increase of 10 cents an hour plus corrections in sectional wage differences (now said to be as great as 40 cents per hour for identical work); time and a quarter for Sunday work; lay-off benefits for members when unemployed; a union shop where none exists; and pension improvements.

According to Mr. Jones, employers



PROFITABLE OPERATIONS

Throughout the industry Hendrix Dragline Buckets are reducing maintenance costs, because they're built to last longer. It's this *extra service* from Hendrix Buckets that makes the big difference in profitable operations!

HENDRIX
DRAGLINE BUCKETS

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

Hendrix Lightweight DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

have "ignored" the lay-off proposal, rejected the Sunday premium pay request, turned down an increased pension proposal for retired members and have almost uniformally offered an hourly wage increase of 5 cents, plus a "small increase in basic retirement benefits." The wage offer, he said, is "woefully inadequate" in view of the climb in living costs and a 6% increase in productivity last year.

The fact that a peaceful settlement has not yet been reached is attributed by Mr. Jones largely to what he calls "the eastern bloc of employers." This group, he said, dominates the industry and has an "unrealistic and unbending attitude" toward employees' welfare. The "choice of bargaining or forcing a strike" now, he asserted, is up to them.

Joint Committee to Guard Jurisdiction of Plumbers

A joint committee formed early this year to promote the mutual interests of labor and management in the plumbing and pipe fitting industry last week moved to protect the jurisdictional interest of the plumbers union.

At its first meeting, the joint industry program committee agreed that any group encountering interference by any craft with the jurisdiction of the united association of plumbers and pipefitters, AFL-CIO, would submit the cases promptly to the construction industry's national joint board for the settlement of jurisdictional disputes. Jurisdiction referred to is that established in 1924.

The joint industry program committee represents the UA, the National Association of Plumbing Contractors and the Mechanical Contractors Association of America.

The committee also authorized a study of ways and means to promote wider use of plumbing and pipe fitting installations and materials, and appointed a special committee to consider changes in the rules covering installation and operation of temporary heating and cooling systems used while a building is under construction.

Refusal to Furnish Men Held Secondary Boycott

A Federal Court in New Jersey has ruled that union refusal to supply workers on a school project where a nonunion plumbing subcontractor was engaged constituted a secondary boycott even though no employer-employee relationship existed. The court considered the refusal to be part of a plan to prevent use of the nonunion sub.

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

Bids: June 3, 1958.

Contract NYA-220.015

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
TAXIWAYS—ADDITIONAL SHOULDERS

Sealed proposals for the construction of additional shoulders for taxiways at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 3, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, May 15, 1958

Prequalification Date: May 22, 1958.

Board of Education
Bureau of Construction

Notice Re: Prequalification Forms for Contractors

NOTICE IS HEREBY GIVEN THAT:
The Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City, 1, N. Y. will receive applications for prequalification from contractors who may wish to submit bids for the proposed hereinafter specified contracts as follows:
General Construction, Plumbing and Drainage, Heating and Ventilating, Electrical Work and Lighting Fixtures for the New Public School 134, Manhattan, Scammel and Henry Streets. New Public School 298, Brooklyn, Glenmore Avenue, and Watkins Street.
Prequalification application forms will have to be secured from and must be submitted to the Superintendent of School Buildings, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, N. Y.
Bids when advertised, will be received from prequalified bidders only.
Time for submitting prequalification application by contractors will expire on Thursday, May 22, 1958.
WILLIAM H. CORREALE
Superintendent of School Buildings,
Design and Construction
Dated: May 6, 1958

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5049) will be received at Denver, Colorado, until June 5, 1958, for furnishing one (1) 16-foot diameter steel penstock with branch outlet pipes. Estimated weight 6,800,000 pounds. Delivery required at dam site. Area available for field fabrication plant if desired, for Trinity Dam, Central Valley Project, California. Delivery is desired within 720 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado. W. A. Dexheimer, Commissioner.

Bids: June 17, 1958.

Contract NYA-980.001

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
EXTENSION OF RUNWAY 13R-31L
PAVING AND UTILITIES

Sealed proposals for the construction of paving and utilities for the extension of Runway 13R-31L at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 17, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, May 15, 1958

Bids: June 17, 1958

Contract BP-170.002

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER NO. 3
PIER SHED

Sealed proposals for the construction of a pier shed for Pier No. 3 to be constructed at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 17, 1958, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman
New York, May 15, 1958

READ THE OFFICIAL PROPOSAL COLUMN OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.40 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

Bids: June 5, 1958.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 5th day of June 1958, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following Projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Oneida	FAC 58-7	City of Rome: East Whitesboro St. Arterial	3.98	9" Cem. Conc. Pavt. = 3.07 Mi. Asph. Conc. Pavt. =	$375,000	$6,864,000
	FASH 58-4	City of Rome: Southerly Hwy. Connections	(5.55	0.91 Mi. 3 H.G.S. Comp. I-Beam 154.5', 137', 126'	Plans $20	
		Project U-UG-693(4), U-1564)	Acc.)	1 Rgs 384.5'; 1 Br. Girder & Comp. I-Beam 585.7' 1 Hgs Reinf. Conc. 36'		
DISTRICT No. 3, E. E. TOWLSON, Acting District Engineer, 333 E. Washington St., Syracuse, New York						
Cortland, Oswego, Onondaga, Tompkins, & Wayne	RC 58-39	9 Various Highways in District No. 3	25.36	Subsealing Cement Concrete Pavement	$18,000 Plans $2	$336,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Genesee (Rte. 19)	FARC 58-28	Le Roy-Pavilion, Pt. 1, S.H. 5538	7.68	Asph. Conc = 7.68 Mi. Including Bridge Repairs	$45,000	$831,000
		Le Roy-Pavilion, S.H. 5582A	(0.38		Plans $5	
		Le Roy-Pavilion, Pt. 2, S.H. 5582	Acc.)			
		Project DF-1004(2)				
Monroe (Rte. 18)	FARC 58-38	Barnard Crossing, Pts. 1 & 2, S.H. 276	1.17	Asph. Conc. = 1.16 Mi.	$12,000	$211,000
		Project Dus-433(2)		Misc. Work = 0.01 Mi.	Plans $2	
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Niagara (Rte. 18F & 104)	FARC 58-50	Lewiston-Youngstown, S.H. 5306 Lewiston Village-Center St., S.H. 1724 Lewiston-Dickersonville, S.H. 617	1.49	Asph. Conc. = 1.39 Mi. Misc. Work = 0.10 Mi.	$20,000 Plans $2	370,000
		Project DS-492(1)				
Erie (Rte. 5)	FARC 58-35	Lackawanna City, South, S.H. 5071 Lake Shore-Lackawanna City, S.H. 5019 Project DU-750(13)	0.58	Asph. Conc., Ty. 2A = 0.49 Mi. Misc. Work = 0.09 Mi.	$20,000 Plans $2	362,000
Erie & Cattaraugus	FASS 58-7	Johnsons Corners-Sardinia, C. R. 225 & 225A Yorkshire Corners-Sardinia Rd., C.R. 72 Project S-456(1)	1.17	Stab. Gravel-Mixed = 1.14 Mi. Asph. Conc. Ty. 2B (Br.) = 0.03 Mi. Including Pres. Conc. Br. 3 Spans 60' Each	$20,000 Plans $2	$378,000
Niagara	FAC 58-8	City of Niagara Falls Arterial Route (Walnut Ave. and Ferry Ave.) Project Du-560(10)	4.11	Traffic Signal System	$6,000 Plans $2	$111,000
DISTRICT No. 6, J. H. THOMAS, District Engineer, State Office Bldg., 30 West Main Street, Hornell, New York						
Allegheny	RC 58-43	Black Creek-Belfast, PSC 1652, S.H. 8529 Belvidere-Transit Bridge-Angelica, Br. No. 2, S.H. 1260 Belmont-Phillips Creek, Pt. 1, Br. No. 1, S.H. 1559	....	Cleaning & Painting 3 Bridges	$900 Plans $2	$16,000
Allegheny (Rte. 17)	FARC 58-37	Bolivar-Wellsville, Pt. 2, S.H. 8253	0.05	Bridge Repair	$4,000 Plans $2	$75,000
		Project DF-421(8)				
Schuyler & Yates (Rte. 14)	FARC 58-44	Gabriels Corners-Starkey, Pt. 2, S.H. 8399 Starkey-Dresden, Pt. 1, S.H. 8399 Starkey-Dresden, Pt. 2, S.H. 8353 Project F-505(7)	10.52	Asph. Conc. = 10.47 Mi. Misc. Work = 0.05 Mi. Including Widen Br. 3-Pl. Girder 411.1' Widen Br. 4-Pl. Girder & Truss—485.7'	$125,000 Plans $10	$2,280,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
St. Lawrence (Rte. 3)	FARC 58-41	Cranberry Lake-Seveys Corners, S.H. 8220	1.41	Asph. Conc., Ty. 1A Including Br. No. 2 Twin Reinf.	$20,000	$372,000
		Franklin County Line-Seveys Corners, S.H. 8241		Conc. Closed Box Span 20' Each	Plans $3	
		Project DF-382(7), DF-386(5)				
Franklin	RC 58-48	Chateaugay-Clinton Co. Line, Br. No. 1, S.H. 5468 St. Regis Indian Reservation-Fort Covington, Br. No. 3, S.H. 1659 Hogansburg-Bombay, Br. No. 1, S.H. 820	....	Cleaning and Painting 3 Bridges	$1,000 Plans $2	$19,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Columbia (Rte. 9)	FARC 58-45	Livingston-Hudson, Pt. 1, S.H. 5072	3.46	Asphalt Concrete	$12,000	$212,000
		Project DF-322(15)			Plans $2	
Orange	PIP 58-1	Palisades Interstate Parkway, Sect. 1. (Queensboro Interchange)	0.67 (1.17 Acc.)	Cem. Conc. Pavt. with Carbon Blk. = 1.28 Mi. Misc. Work = 0.56 Mi. Including Hgs Comp. I-Beam 2 Spans Total 159.3' HGS R.C. Rigid Frame 59.4' Br. Twin R.C. Closed Box 15' Ea.	$80,000 Plans $5	$1,441,000
Rockland (Rte. 59)	FGRC 58-52	Knapps Corners-Nyack, S.H. 5178	0.91	9" Reinf. Conc. Pavt. = 0.72 Mi. Asph. Conc. Ty. 2B = 0.09 Mi. Misc. Work = 0.10 Mi. Hgs & Rrgs Pres. Conc. Beam 322' Br. Pres. Conc. Beam 132'	$65,000 Plans $5	$1,170,000
		Project Du-Dug-1066(3)				
Orange (Rte. 17)	RC 58-2	Palisades Interstate Park-Goshen, Pt. 3, FASH 53-7	0.44	Asphalt Concrete	$9,000 Plans $3	$159,000
Westchester	FINET 58-1 NET 58-2	New York State Thruway-New England Sect., Subdivisions 1, 2, 2A, 3, 4, 5 Project I-1068(16)	11.31	Chain Link Fencing Stabilized Bit. Shoulders Lighting Conduit System	$85,000 Plans $3	$1,613,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New						
Chenango (Rte. 7)	FARC 58-42	York Afton-Bainbridge, S.H. 8075 Afton-Bainbridge, S.H. 5261 Project DF-360(10)	2.49	Asphalt Concrete Including Bridge Widening	$23,000 Plans $2	$402,000
DISTRICT No. 10, M. E. GOUL, District Engineer, 325 W. Main Street, Babylon, L. I., New						
New York	FAHRD 58-1	York Harlem River Drive, Cont. 145A (West 145th St. to Seventh Ave.) Project U-UG-1133(2)	0.50	Asph. Conc = 0.48 Mi. Cem. Conc. Pavt. = 0.02 Mi. on Reinf. Conc. Slab and Pres. Conc. Viaduct	$280,000 Plans $20	$5,123,000
Suffolk	FASH 58-5	Sunrise Highway Extension, Cont. 1. (Phyllis Drive to Yaphank Ave.)	6.82 (7.00	9" Cem. Conc. Pavt. = 4.46 Mi. Demolition = 2.16 Mi. Misc. Work = 0.20 Mi. Including 2 Hgs Comp. WF	$260,000 Plans $10	$4,724,000
		Project DU-947(13)	Acc.)	Beam 4 Spans @ 212 Tot. 4 Spans @ 212.3' Tot. Hgs Comp. Welded Pl. Girder 4 Spans 329.5' Tot.		
Suffolk (Rte. 25)	FARC 58-57 FARC 58-57	Mattituck-Greenport, Pts. 1 & 3, S.H. 8229 Mattituck-Greenport, Pt. 4, S.H. 1719 Proj. DF-378(8)	2.62	Asph. Conc. = 2.49 Mi. Misc. Work = 0.13 Mi.	$42,000 Plans $3	$766,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON

SUPT. OF PUBLIC WORKS

OFFICIAL PROPOSALS

Bids: June 5, 1958.

City of Rye, Westchester County, New York
Refuse Disposal Plant

Sealed bids for the construction of one of two types of Refuse Disposal Plant, (A, using circular furnaces; B, using rectangular furnaces) for the City of Rye in the County of Westchester, New York will be received at the office of the City Clerk of the City of Rye, Municipal Hall, Purchase Street, Rye, New York, until 5:00 P.M. EDST June 5, 1958 at which time the bids will be publicly opened and read aloud at a meeting of the Common Council.

The Plans and Specifications cover two entirely separate and distinct Projects for a Refuse Disposal Plant one designated "Project A", using circular furnaces and the other designated "Project B", using rectangular furnaces, each with all accessories, and include the Plant Building, Furnaces and their Equipment, Chimney, Plumbing, Heating and Ventilating, Electric Work, and other miscellaneous items of work. Each Project has been divided into various Divisions, permitting separated bids by different trades.

The Information for Bidders, Form of Bid, Form of Contract, Form of Performance Bond, together with the Specifications and Contract Drawings, may be examined at the office of the City Engineer at Square House, Rye, New York or at the office of the Consulting Engineer, Henry W. Taylor, 151 West Merrick Road, Freeport, New York until May 29, 1958.

Copies thereof can be obtained upon the deposit of $25.00 for each set. The full deposit will be returned to any person submitting a bid in accordance herewith and returning one copy of the Plans and Specifications in good condition within thirty (30) days following the award of contract or the rejection of the bid of such person; a refund of $10.00 will be made for any other sets of Plans and Specifications returned in good condition and within thirty (30) days after the award of contract or rejection of such Plans.

Checks for payment on the Plans shall be made payable to the City of Rye, New York.

Each bidder must deposit with his bid certified check or cash in an amount not less than five per cent (5%) of the amount of his bid. Any bidder submitting bids on corresponding Contracts for both Projects shall make one deposit based on the larger of the two bids. The successful bidder will be required to post a performance bond in form satisfactory to the Common Council in the full amount of the Contract. Should said successful bidder fail to execute the Contract and post the required performance bond within seven (7) days after notice of award, the check or cash will be forfeited to the City of Rye. Checks or cash of unsuccessful bidders may be held until the contract award is approved or all bids rejected, after which they will be returned within three (3) days.

The Common Council reserves the right to waive any informalities in any bid and to reject any or all bids for either or both Projects. If the Council decides to award contracts under either Project it may accept any bid made under such Project and will reject all bids made under the other.

No bidder may withdraw his bid after acceptance thereof by the City of Rye or within thirty (30) days after the actual opening thereof.

By order of the Common Council of the City of Rye.

By: R. Fred Talento
City Clerk
Raymond W. Murphy
City Engineer

Dated: April 16, 1958
Rye, N. Y.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5052) will be received at Denver, Colorado, until June 10, 1958, for furnishing eight (8) 15-foot diameter steel penstocks averaging about 670-feet long, and four (4) 8-foot diameter steel outlet pipes, averaging about 890-feet long. Total estimated weight 19,450,000 pounds. Delivery required at dam site, area available for field fabrication plant if desired, for Glen Canyon Dam, Colorado River Storage Project, Arizona-Utah. Delivery is desired within 840 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: May 27, 1958.

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR THE
CONSTRUCTION OF RELOCATED ELECTRICAL FACILITIES IN LEWISTON, NIAGARA AND NIAGARA FALLS
NIAGARA COUNTY
NEW YORK
SPECIFICATIONS NO. PA-N-25034
NIAGARA CONTRACT NO. N2

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the complete installation of the relocated electrical facilities in Lewiston, Niagara and Niagara Falls, Niagara County, New York, until 10:30 A.M. Eastern Daylight Saving Time on the 27th day of May, 1958, at the Authority's Office, 18th floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:

Estimated:	
16,000 cu. yds.	Concrete
5,800,000 pounds	Erecting structural steel structures
440 structures	Wood pole structures-various types from 12 kv to 230 kv
82 miles	Line Conductors
60 miles	Overhead ground wire
4,000 lin. ft.	4 conduit duct bank
2,500 lin. ft.	6 conduit duct bank

The word shall be completed on or before December 31, 1960.

Plans, Specifications and Proposal Forms for the work may be obtained only from the Power Authority of the State of New York, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, upon application and prepayment of a fee of Twenty-Five Dollars ($25.00) for initial set of Contract Documents and Fifteen Dollars ($15.00) for each additional set, no part of which will be refunded. Plans, Specifications and Proposal Forms will be on file in the Outhority's office and in the office of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Mass., for the inspection by prospective bidders.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5048) will be received at Ogden, Utah until 10 a.m. Mountain Standard Time, June 17, 1958, for furnishing labor and materials for Earthwork, Pipelines and Structures, Trunklines 1.9, P-3.7, and P-20.5 including Pumping Plants, Weber Basin Project, Utah. Location near Ogden, Utah. Principal items are 38,400 cu. yds. excavation and backfill of pipe trenches; 400 cu. yds. concrete; 21,589 lin. ft. furnishing and laying trunkline pipe 16, 24, 27, and 36-inch in diameter with various working heads; constructing superstructure for ValVerda Pumping Plant; furnishing and installing 8 motor driven pumping units; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, P. O. Box 360, Salt Lake City 10, Utah; P. O. Box 387, Ogden, Utah; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5047) will be received at Prineville, Oregon until 10 a.m. June 12, 1958, for furnishing labor and materials for Prineville Dam, Crooked River Project, Oregon. Location near Prineville, Oregon. Principal items are 1,500,000 cu. yds. excavation for dam, structures and for embankment materials; 9,100 cu. yds. of concrete in structures and tunnel lining; installing 4 high pressure gates in outlet works; and other work. Completion time 800 days. For particulars, address Bureau of Reclamation, P. O. Box 477, Prineville, Oregon, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: June 3, 1958.

General Construction of Housing for Elderly

The Chicago Housing Authority invites properly qualified bidders to submit figures for all labor and materials required for the General Construction of Housing for Elderly, consisting of one eight-story and penthouse elevator building, containing 92 dwelling units, mechanical work, utilities, landscaping and site improvements on a site located in the vicinity of North Leavitt St., Diversey Blvd., and the North branch of the Chicago River.

Sealed bids are to be delivered in person or by mail to the office of the Director of Development, Chicago Housing Authority, 608 S. Dearborn St., Chicago 5, Illinois, until 2:00 P.M., local time, on June 3, 1958, immediately after which time and at such place all bids will be publicly opened and read aloud.

Contract documents, plans and specifications may be obtained by depositing $50.00 per set with the Chicago Housing Authority representative, Lowenberg & Lowenberg, Engineers & Architects, 111 W. Monroe St., Chicago 3, Ill., on or after May 1, 1958.

Alvin E. Rose
Executive Director

U. S. Government

Sealed bids for Ninth Avenue Tunnel, at the U.S. Post Office, Morgan Annex (341 Ninth Avenue), New York, will be received until 2:00 P.M. E.D.S.T., June 6, 1958, c/o Business Service Center, Ground Floor, 250 Hudson Street, New York 13, New York, and then publicly opened. Bidding material may be obtained from the Business Service Center, Ground Floor, General Services Administration, 250 Hudson Street, New York 13, New York.

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EMPLOYMENT OPPORTUNITIES

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Subject to Agency Commission.

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Position Wanted ads take ½ of above rate.

Box Numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

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Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD
P. O. Box 12, N. Y. 36, N. Y. May 29th issue closes May 19th

PRESTRESS MGR. WANTED

To coordinate design, production, delivery, erection, sales and promotion of Prestressed Concrete products in Midwest Plant.

Submit resume and salary expected to

P-7931, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

SALESMAN WANTED

In Gulf States Area, Caterpillar Dealer, Age 30—50. Experienced in tractors and earth-moving machinery. Used equipment in particular.

SW-7936, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

OVERSEAS

An excluisve association for foreign construction workers. Learn the advantages of membership. Write for free descriptive details. Overseas Americans, Inc., 7 West 44 St., New York 36, N. Y. Dept. V.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Superintendent Wanted for road construction. Rieth-Riley Construction Co., Inc., P. O. Box 477, Goshen, Indiana.

Resident Engineer, registered engineer with qualifying experience on construction of 1.5 mgd capacity sewage treatment plant and intercepting sewers. Complete resume of experience and education and statement of salary requirement in letter of application. Jones, Henry & Williams, 821 Security Building, Toledo 4, Ohio.

Bridge Designing Engineer, well qualified. Forward resume of education and experience with salary requirements to Macomber & Faber, 1824 N. 4th St., Harrisburg, Pa.

Highway Engineers—Highway Engineers with a minimum of 3 years experience. Excellent opportunity with established consulting engineering firm in Middle West. P-7909, Engineering News-Record.

Wanted: Engineer Estimator, Missouri General Contractor, work in home office estimating heavy and highways, including, bridges, airports, dams, earth and concrete. Experienced estimator only need apply. Salary open as to qualifications. P-7920, Engineering News-Record.

Four Draftsmen, Civil, Water and Sewerage, Layout Experience. Also one Chief of Party, Land Surveying, Municipal and Subdivision Experience, New Jersey Shore Area. P-7961, Engineering News-Record.

(Continued on following page)

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For industrial, institutional, and public work:

5 SENIOR ESTIMATORS
5 SUPERINTENDENTS

Excellent salaries, working conditions, opportunities and fringe benefits.

Contact chief estimator

LURIA CONSTRUCTION CORPORATION
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University 7-4657

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Experienced in the design or detailing of Erection Methods for Bridges and Structures. Write stating age, education and exper. Engineering office located New York City. Reply:

P-7501, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

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NOT LESS THAN 15 YEARS EXPERIENCE IN BRIDGE DESIGN AND DETAIL.
SQUAD BOSS EXPERIENCE PREFERRED.
PAID SICK LEAVE AND VACATION.
ATTRACTIVE PENSION PLAN.
APPLY BY LETTER GIVING EDUCATION AND EXPERIENCE.

CITY OF CHICAGO
DIV. OF BRIDGES AND VIADUCTS
ROOM 600 320 N. CLARK ST.

ENGINEER

For major industrial construction firm. Location Southwest. Must have at least 6 years heavy construction, hydro-electric experience. Degree. Age 30 to 35. Reply P-7928, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

PAVER FOR SALE

Used KOEHRING 16-E twin batch rubber mounted paver, diesel power, complete with skip, boom, bucket, 200 gallon reserve tank and Ad-Mix meter. Machine new 1951 but only mixed about 6,000 yards. Excellent condition.

Contact - KENNETH WALLACE
Wauneta, Nebraska - Phone 152

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Highly qualified—Capable of performing all design work, writing reports and directing programs on major highway design projects.

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Openings available in senior, intermediate, and junior grades. Permanent positions for competent adaptable men. Ideal working conditions in our own new modern air-conditioned building. Unsurpassed company-paid hospitalization, life insurance and retirement plans.

Excellent opportunity for professional experience and advancement. 40-hour week. Liberal salaries. Send complete resume of education and experience, with salary requirements to:

PALMER & BAKER
Engineers, Inc.
P. O. Box 346 . Mobile, Ala.

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Career opportunities for graduate engineers with minimum 6 years experience supervising maintenance engineering functions in oil refining or producing facilities, power plants, heavy industrial installations and supporting community facilities. For work in Saudi Arabia as Staff Engineers. Also opportunity for engineers with production control experience.

High salary plus liberal all-inclusive benefits conducive to large savings. Excellent community facilities.

Write outlining background and experience. Please include telephone number.

Recruiting Supervisor, Box 215

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

CIVIL ENGINEERS

Vacancy due to a promotion in Madison, Wis. Graduate engineer with some experience to begin in Engineering Dept. at about $455 a month, **unless** special arrangements can be made for a higher entrance salary due to qualifications. Annual and longevity increases to $572. Office and field work in design and construction of sewer, water, street, sidewalk and curbs. Possession of Engineer-in-Training Certificate required. No residence restrictions for U.S. citizen to begin work. Wisconsin Retirement Fund and Social Security benefits. Personnel Dept., 404 City-County Bldg., Madison 9, Wis.

(Continued from preceding page)

EMPLOYMENT SERVICE

Better Positions—$6,000 to $35,000. Want a substantial salary increase, more opportunity or different location? This national 47 year old service connects you with best openings. You pay us only nominal fee for negotiations: This we refund when employer pays placement fee. Present position protected. In complete confidence, write for particulars, R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo, N. Y.

POSITIONS WANTED

Civil Engineer: 33. M.S. and P.E. Seven years teaching, principally Structures. Varied field experience. Currently Assoc. Prof. Seeking challenging position in Field, Office, or Education. PW-7767, Engineering News-Record.

Constructor's Engineer—indust. & commercial exp. in design office; constr. plant & field will sell, estimate or build—U.S.A. or foreign. PW-7771, Engineering News-Record.

Accountant experience both field and home office, Joint Ventures, heavy construction, dams, roads, under ground systems air fields, industrial, water and sewer, go anywhere. PW-7833, Engineering News-Record.

Construction Manager: 15 years diversified experience. Exec. Ability. Engineering and Field Supervision, Estimating, Expediting. Complete Industrial and Power Plant Building Construction, with Process Installations, from customer contact to completion of projects. Desire permanent connection with Engineering and Construction Firm. Industrial Firm or expanding Power Utility Co. PW-7865, Engineering News-Record.

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Project Director. General Manager. 39. heavy construction Govt. and State, Florida highway construction 12 yrs estimating and field experience, graduate engineer and now employed. PW-7915, Engineering News-Record.

Reinforcing Steel Detailer—Estimator with 20 years experience available. PW-7914, Engineering News-Record.

Project Bridge Engr., 31. graduate P.E. 9½ yrs. bridge design, and design supervision exp. New England or Mid-Atlantic. PW-7904, Engineering News-Record.

Vice-President. medium size construction firm: Registered Eng., Bachelor's Degree Civil Eng., Master's Degree Bus. Admin., 10 yrs. experience one firm as Field Engineer, Superintendent, Estimator and Project Manager, Partner. Age 35, married, 3 children. Scandinavian. Salary past 4 yrs. $15,000 adjusted by bonus & dividend. Desire aggressive position with opportunity. PW-7698, Engineering News-Record.

Civil Engineer. BSCE. Licensed. Experienced in Municipal and Highway work. PW-7964, Engineering News-Record.

Top Flight Constr. Man—Project Managed— Gen. Supt. Field Supt. capable of handling—organizing estimating bridges — concrete dams—tunnels—power plants—public bldgs—commercial bldgs—industrial plants—water treatment—sewage treatment plants—housing development—sewers—coffer dams heavy foundations—driving piles. 25 years exp., 45 yrs, B.S.C.E. Registered. Now working. PW-7953, Engineering News-Record.

When Answering
BOX NUMBERS...

to expedite the handling of your correspondence and avoid confusion, please do not address a single reply to more than one individual box number. Be sure to address separate replies for each advertisement.

POSITIONS WANTED

E.E: Fifty-six, married, no children, excellent health. Experience principally in field or reviewing plans and specifications including estimating and bidding for contractor. Covers dist. Trans., indus., projects, hydro-installations. Design. No finish board work. PW-7955, Engineering News-Record.

Cost Estimator, BSC, 5 years exp. water treatment equipment mfg. & const. for municipalities and industries. Age 29. PW-7943, Engineering News-Record.

Construction Executive Available—22 years broad experience in both Heavy and Building construction. Recently associated as General Manager and Vice Pres. for period of 7 yrs. with well known International General Contractor's Western District Office. Have proven record of exceptionally excellent returns. Directed Construction of many Multi-million dollar projects located in Western States and Alaska. Age 45. Interested in procuring position with substantial contractor. Prefer Western States location. Complete resume and references furnished upon request. PW-7969, Engineering News-Record.

Young Engineer with diversified background in administration and engineering associated with Boston architectural office seeks basically administrative position. Resume available. PW-7963, Engineering News-Record.

POSITIONS WANTED

Construction Supt.—Assistant Supt. A.E.C. "Q" cleared. Have 28 years varied construction experience on large projects. Industrial, steam power plant, waterfront, multiple-story, sewer and water. Married, no children, will relocate. Field engineering background. Have supervised all trades. Complete resume, photo and references furnished upon request. Minimum salary: $10,000.00. Available immediately. PW-7947, Engineering News-Record.

Construction Safety Engineer, desires position in any locality. Experience in heavy equipment, excavation, on Utility and General Construction. References. Available May 10. PW-7988, Engineering News-Record.

Construction Superintendent engineering background 45, 20 yrs exp in heavy construction & building trades in chemical, atomic, hydroelectric plants. Earthrock fills & electronics R.R. yds. Will travel anywhere. PW-7991, Engineering News-Record.

Project Manager or Superintendent for architect or contractor available. Recently completed luxury type 325 room El San Juan Hotel. Working knowledge Spanish and French. Also experienced heavy construction and housing. Age 44, single. Airmail replies to: Allen McSherry, P. O. Box 1215, San Juan, Puerto Rico.

SEARCHLIGHT SECTION

(Classified Advertising)

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AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

$2.40 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

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Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.

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CONSTRUCTION CONSULTANTS
Satsuma, Florida

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NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

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State Quantity, Sizes, Make, Accessories, Price, etc.
W-7772, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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Programming available for other applications. For full information write to:

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FRanklin 2-7346

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Two cubic yards in good condition or 34E dual drum paver.

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New all-welded steel, open deck, cargo barge with ½" checkered plate deck, ⅜" plate bottom, ½" plate sides. Dimensions 90' long by 30' wide by 9'3" deep. Can be seen at Wiley Manufacturing Co., Port Deposit, Md. Phone Drake 5-2111. Price f.o.b. Port Deposit, Md., $40,000. Photos available on request.

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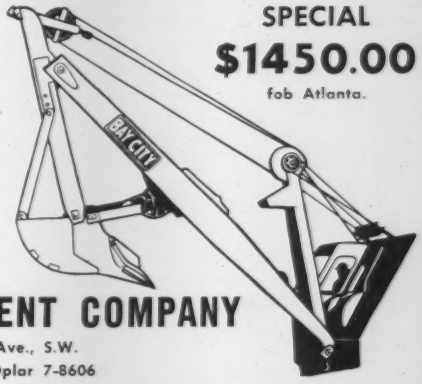
Backhoe attachments complete for ¾ Yd. Bay City with 36"-30" bucket W/ teeth. Also adaptable for ¾ Yd. Lima, Ensley, Bucyrus Erie, Lorraine, Unit, P & H and Linkbelt.



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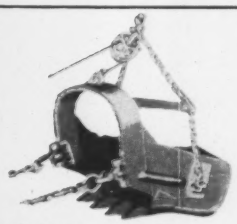

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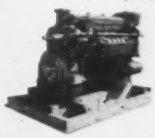

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625 Page Diesel Dragline, 150', 10 yd.
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621-S Page Diesel Dragline, 135', 6 yd.
7-W Bucyrus Erie Dragline, 180', 5 yd.
5-W Bucyrus Erie Dragline, 120', 6 yd.
2400 Lima Dragline, 120', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
1055 P&H Dragline, 85', 4 yd.
71-B Bucyrus Erie Comb. Shovel-Drag
170-B Bucyrus Erie 6½ yd. Elec. Shovel
150-B Bucyrus Erie 6 yd. Elec. Shovel
4500 Manitowoc 5 yd. H.L. Shovel
120-B Bucyrus Erie 4 yd. Elec. Shovel
2400 Lima Medium H. L. Shovel
1201 Lima 2½ yd. H. L. Shovel
54-B Bucyrus Erie 2½ yd. Standard Shovel
80-D Northwest 2½ yd. Standard Shovel
25 Northwest ¾ yd. Backhoe
Unit 1020 ¾ yard Shovel
Also, smaller Shovels and Draglines
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Euclid Trucks—Rear & Bottom Dump
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600 Reich Heavy Truck Mounted Rotary Air Drill
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Dozers, Scrapers, Graders, Front End Loaders
Shovel, Dragline, Backhoe Attachments
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Frank Swabb Equipment Co., Inc.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

FOR RENT
1—3250 Manitowoc Shovel 2½ Cu. Yd.
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Lifteranes
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LOW COST INSTALLATION AND OPERATION
CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 to 20 TONS
SELL, RENT or BUY
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Top-Condition erection cranes
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STEEL MILLS
IN LUXEMBOURG
BELVAL P *straight web section best suited booking*

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2—70FDT-89W Euclid Bottom Dumps. 13 Yd. capacity. Cummins 200 H.P. diesel engine. Year 1951. Excellent condition. Priced for immediate possession. Located Syracuse, New York.
All offered subject to prior sale or disposition.
L. B. SMITH, INC.
357 W. Fayette St. Syracuse, N. Y.
Phone GRanite 5-2196

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1½ to 10 Ton — 18" to 56" Track Gauge
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4800 PCS. BETH. SP6, A65' 50' 56' & 48'
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THE "YOU AUTO BUY NOW" CAMPAIGN currently aimed at breaking buyer resistance for the ailing automotive industry has its lessons for construction. For, there's also room for a campaign to sell construction, particularly private—commercial and industrial—construction. Those in this area of construction could help themselves while also helping to build the country out of its recession—or at least revive its interest in growth.

Construction selling is already strong in the homebuilding segment of the industry, aided by a new federal housing law that offers more attractive sales terms. Last week, also, a dramatic selling effort began in the commercial building field with the announcement that a New York builder had obtained an 80 year lease on property adjoining Grand Central Terminal on which he plans to erect a 50 story skyscraper offering 3 million sq ft of rentable space; the selling job is to rent this space to assure that the project can be financed. The homebuilders' hard-selling effort (see p. 23) could have a quick, measurable effect on the economy. Large commercial ventures take more time to exert an effect, but are a powerful stimulus nevertheless.

Selling, of a sort, is also having its effect in the area of public works. Congress "bought" a highway law with little lost time. Federal lending to local communities is under consideration. And public works agencies at all levels of government seem anxious to step up the construction spending rate on going projects. However, as has been pointed out before, vast public works projects cannot be turned off and on as water from a faucet. The necessary legalities—engineering studies, bond elections, contract drawings, bidding and site acquisition—all take much time.

Getting such preliminaries out of the way is, of course, dependent on many sorts of selling efforts, which deserve high priority today. But the fact remains that public works are simply not the best and fastest countercyclical influence on our economy. That role is best played by private construction.

The buyer of many types of private construction is not hamstrung by procedure; he can decide today to start tomorrow on a new structure (or renovation of an old one), and it will be done. And small though each individual private commercial or industrial project might be, there are thousands of them waiting to be sold. Admittedly, manufacturing industry is not going to be sold on vast increases in plant and equipment at a time when its production capacity far exceeds the demand for its products. McGraw-Hill's recent study of capital outlay planned by industry (ENR Apr. 17, p. 174) showed that still declining expenditures in 1958 will be only 44% for expansion, 56% for replacement and modernization. Yet, early this month, Roger Blough, board chairman of U.S. Steel, was reported as telling an industry audience that this is a "really good time" for building.

This is a good time for private construction; and it could get better. Last week also saw a bill dropped into the Congressional hopper, proposing to speed depreciation on industrial plant and equipment begun in a current 18 month period (ENR May 8, p. 114). Such legislation could provide the same kind of financial impetus for industrial building that the new housing law has given homebuilding. However, such subsidy can't work alone. Those in the construction industry, who want to sell their capacity to build industrial and commercial structures for private investors, will have to get in there and sell hard—just as the homebuilders must, and just as the automakers with their corny, but arresting, "You Auto Buy Now" campaign are trying to do. This is a good time to build, and the construction industry should miss no chance to prove it.

With One Voice

A ONE-SENTENCE LETTER was received in the White House last month. It was addressed to the President of the United States, and it was signed by the presidents—or other official spokesmen—of 16 national engineering groups.

What this short letter said is important: "The undersigned representatives of all of the principal national engineering societies of the United States, having a total membership in excess of 300,000, hereby individually and collectively offer their full cooperation in the solution of the many technological problems that affect our security and economy." Eloquent in its simplicity, this message will be important to the nation and to the engineering profession to the extent that its offer of cooperation is accepted.

And the very fact that this letter was sent is of itself important. For here the engineering professions were speaking with one voice. True, the credit for initiating this action goes to Engineers Joint Council and its president, Enoch R. Needles, whose signature led the list. But to each signatory, including Clark A. Dunn of the National Society of Professional Engineers, which has not yet seen fit to join EJC officially, goes credit for demonstrating how forcefully the engineering profession can speak when it speaks with one voice.

Some such expression of the engineering profession's solidarity in backing our national scientific endeavors has been recognized as desirable for some time. Science and engineering complement one another both in the development of the instruments and apparatus that the scientist uses and in the extension of his scientific discoveries to practical use. EJC performed a real service in providing the opportunity for emphasizing the engineering profession's feeling of responsibility for the nation's "security and economy."

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